MINERAL COUNTY COMMISSIONERS

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LIQUOR BOARD

ARLO K. FUNK, Member

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FEB 2 3 2000

February 10, 2000

Ms. Wendy Dixon
EIS Project Manager, M/S 010
US Department of Energy
Yucca Mountain Site Characterization Office
Office of Civilian Radioactive Waste Management
PO Box 30307
North Las Vegas, NV 89036-0307

SUBJECT: MINERAL COUNTY'S FINAL COMMENTS to the Draft Environmental Impact
Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and HighLevel Radioactive Waste at Yucca Mountain, Nye County, Nevada

Dear Ms. Dixon:

Consistent with requirements of the National Environmental Policy Act (NEPA) and with the fiduciary responsibility vested to it through designation by the Secretary of Energy as an "Affected Unit of Local Government" pursuant to the Nuclear Waste Policy Act (NWPA) the Board of Mineral County Commissioners is submitting these comments to the Draft Environmental Impact Statement (DEIS) for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada.

We trust that the comments which follow will serve to assist the Department of Energy (DOE) to prepare a Final Environmental Impact Statement (FEIS) which meets the statutory requirements for a "legally sufficient" document which can be used by the Secretary of Energy, the President of the United States and Congress in making major federal decisions regarding the transportation and disposal of spent nuclear fuel and other high-level radioactive waste. Failure by the DOE to adequately address Mineral County's comments in preparing the FEIS may render the document legally insufficient to support major federal decisions.

The following pages are Mineral County's final comments to the Department of Energy's Draft Environmental Impact Statement (DEIS) for Yucca Mountain. These statements have been presented to you by our "Affected Units of Local Government" representative, Judith A. Shankle. We have approved the statements provided to you by Mrs. Shankle and ask that the verbal comments by her be incorporated by reference and made a part of these written comments.

At this time we also are sending any written comments made by the residents of Mineral County, and any supporting documentation.

ACKIE WALLI

Chairman

Mineral County Commissioners

W. Zunk

DAN DILLARD
Vice Chairman

Mineral County Commissioners

ARLO K. FUNK Member, Mineral County Commissioners

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Department of Energy's (DOE's) Draft Environmental Impact Statement (DEIS) for Yucca Mountain

A. GENERAL COMMENTS

A number of issues are not addressed properly, not addressed adequately or not addressed at all in the Draft Environmental Impact Statement (DEIS). These issues include but are not limited to:

* Impacts of Transportation Aspects of Proposed Action

2... <u>Disclosure inadequate:</u> The DEIS does not include enough information to support a decision on modes, routes or corridors for the transportation of spent nuclear fuel (SNF) and high-level radioactive waste (HLW).

The DEIS omits essential information regarding the affected environment and the anticipated environmental impacts. It must specifically identify and describe: (1) the national transportation routes over which SNF and HLW would travel to Yucca Mountain and (2) the main national transportation nodes, and the numbers of shipments that would pass through them. Computer models used in the DEIS contain such information, and the DOE must disclose it at this time.

The DEIS must specifically consider the impacts of the transportation elements of the proposed action upon the nation's and Nevada's transportation systems. It must, for, example, analyze impacts upon transportation systems of: (1) an accident involving radiation release on main national routes, (2) storage of rail cars carrying SNF and HLW on rail sidings for extended periods of time, and (3) routing of dedicated trains subject to speed restrictions.

The DEIS must disclose that potential transportation impacts of the proposed action would be concentrated in Nevada and could result in numerous environmental impacts for, as discussed later in this document. The DEIS must not only disclose the potential environmental impacts for shipments along the five rail corridors, the heavy-haul truck routes, and I-15 in southern Nevada; but also for any alternative Nevada routes that would be used during system repair, maintenance, and construction; during weather emergencies; or for the mostly legal-weight truck scenario.

<u>Analysis must not be postponed:</u> Although the DOE says it does not know when it will make the transportation decision, transportation is integral to the project and must be fully covered in the DEIS. Disclosures of transportation impacts should be included now. Furthermore, future decisions must not rely on the sketchy, inadequate information contained in the DEIS.

<u>Emergency Response</u>: The DEIS fails to adequately analyze potential impacts on local governments for emergency response activities related to shipments of SNF and HLW. It fails to describe baseline conditions for emergency response services, and lacks any meaningful discussion of emergency response needs or capabilities as they relate to local governments. The DEIS must address the availability and capabilities of emergency response services, existing and required.

The DEIS inadequately analyzes increased exposure of and health risks to emergency first responders to transportation accidents. Local emergency personnel are likely to be the first to respond to transportation incidents. A wide range of response capabilities (i.e., personnel, training, equipment, and policies) exist along transportation routes nationally and in Nevada.

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<u>Environmental Justice</u>: The DEIS inadequately analyzes the project impacts in relation to environmental justice in Nevada as well as nationally. It relies on outdated census data for Nevada, and concludes that impacts to minority and low income individuals will not be disproportionately adverse. Since individuals who reside in rural areas are often of lower income, Mineral County disagrees. Because of the nature of rural life, communities are dispersed, rather than concentrated. Given the limited political power of rural communities, they are often targeted for unwanted projects (projects which are dangerous, hazardous, and which no other area would tolerate). DOE's risk models are based on avoiding urban areas, and presume that risks from the project should be borne by rural individuals.

Mineral County understands the President's Executive Order (February 16, 1994) to mean that the DOE should consider the effects of past programs and policies on communities, as well as additional impacts of the Yucca Mountain Project. With regard to public health impacts from exposure to radiation the DOE must go beyond the minimal analysis in the DEIS. Rural low income populations received damaging doses of radiation in the 1950s and 1960s from aboveground and underground nuclear weapons tests conducted by the DOE's predecessor, the Atomic Energy Commission. The DOE must take these disproportionately high adverse health and environmental impacts of its programs, policies, and activities into consideration.

* Confusing Information

The DEIS is confusing and misleading with regards to future generation of SNF and HLW. When discussing the no-action alternative, the DEIS says that all nuclear power plants will be closed by 2116 (p.7-28), that decommissioning will occur in 2052 (p.7-29), and that nuclear power plants would be closed after the first 20-year licensing renewal period (pp.7-43 and -44). The cumulative impact analysis considers SNF generated until the year 2046, and says that Modules 1 and 2 represent "all" projected SNF and HLW (p.8-5). No such statements are made regarding the proposed action.

If the DOE proposes to close all commercial nuclear power plants by a certain year, this must be explicitly stated as part of the proposed action. If not, both the proposed action and the no-project alternative must consider SNF and HLW generated after that year. Presently, the analysis of the proposed action does not account for 35,000 tons of SNF and HLW generated through 2046, over and above 70,000 tons that would be placed at Yucca Mountain. Nor does the DEIS account for SNF and HLW generated after 2046. Because of these errors, the DEIS greatly underestimates the costs of the proposed action. (See Table 2-5.)

* No-Action Alternative

The DEIS must include a realistic no-action alternative. It repeatedly says that the no-action scenarios are unlikely and unreasonable; however, it says these scenarios provide a baseline for comparison. The no-action alternative is only the absence of the proposed action. It must be analyzed fairly using consistent assumptions regarding institutional controls and all other relevant factors.

According to the DEIS (p.3-140), the description of the affected environment for the no-action alternative "describes the affected environment that reflect (sic) the average or mean conditions of the sites." Thus, "average" conditions mean nothing and provide no information that one could use to evaluate the no-action alternative. The DOE presumably knows, and must disclose the existing conditions in the vicinity of the sites that generate SNF and HLW. Without a description of the affected environment, no meaningful analysis of anticipated impacts is possible.

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* Consultation

The DOE has failed to cooperate and consult adequately with federal agencies (the Bureau of Land Management (BLM), the Navy, the Federal Highway Administration, and the Federal Railroad Administration). The regulations implementing the National Environmental Policy Act (NEPA) require the DOE to adequately consult with the railroad industry which DOE has not.

Appendix C, Interagency and Intergovernmental Interactions, summarizes the DOE's consultations in relation to this DEIS. The DOE correctly identifies the many interests of the BLM, including land withdrawal, management of land for transportation corridors, and rights-of-way and easements for transportation. Comments of the Secretary of the Interior must be included with the Secretary of Energy's recommendations to the President. Despite the BLM's major role, the DOE met with the BLM only once, on September 15, 1998 (and only to brief them). This is an inadequate and unacceptable level of consultation.

The DEIS reflects that the DOE has not gathered the kinds of information it needs from the BLM to analyze the rail routes, specifically, in a comprehensive manner. The lack of ongoing consultation with the BLM is evident. The DEIS Summary does not indicate that the DOE received any information from the BLM.

Table C-1 also indicates there was no consultation or interaction with the Federal Highway Administration or the Federal Railroad Administration, both of which should be consulted about a national shipping campaign spanning 24 years and through 43 states. There is no mention of interaction with other non-governmental organizations who have specialized information, such as railroad and trucking trade associations.

Consultation with the U.S. Navy was notably absent. However, the DOE consulted with the Air Force because of land use and airspace impacts, they did not consult with the Navy. The Fallon Naval Air Station's most recent environmental document indicates that now and in the foreseeable future, some of the lands being considered for rail routes are also being considered for the Navy overflight areas and the installation of equipment. The DOE must consult with the Navy. This is a significant oversight.

* Mitigation

<u>Mitigation generally: trust account:</u> Since this is a unique, unprecedented federal action which would affect 43 state for an extremely long time, the DEIS fails to identify adequate impact mitigation. The mitigation program must include a special trust or escrow account for prompt and complete compensation to individuals affected by radiation along transportation routes, as well as a baseline health assessment to enable the identification of such effects.

* Bias

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Both in general approach and specific language, the DEIS reflects a bias toward implementation of the proposed action. It dismisses the no-action alternative, includes many unsupported conclusions, and either writes off or postpones analysis of important impacts. Numerous examples of biased language (i.e., "permanent isolation", "useful information", "detailed descriptions") can be cited.

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* Pending Standards and Changing Guidelines

The disclosure of the DEIS is seriously flawed because it does not address the U.S. Environmental 11

Protection Agency's (USEPA's) pending standards for protecting public health and safety in relation to a repository at Yucca Mountain. The disclosure also fails to address the DOE's decision to amend its repository siting guidelines during the comment period on the DEIS. Both of these flaws present the public with a moving target and contradict the concept of due process.

* Summary Tables

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The DEIS fails to include summary tables showing, for example, latent cancer fatalities (LCFs) for all 12 alternatives and scenarios in one table, using consistent units. In Volume I alone, the reader must consider over 700 pages of text and almost 300 tables, making summary-level comparisons difficult if not impossible.

B. SPECIFIC COMMENTS

"Generic" transportation analysis. Specific transcontinental routes and communities along the way are not identified.

(a.) Preferred Transportation. The DEIS says that the DOE has not chosen a preferred transportation mode, corridor, or route; that it does not know when it will make such decisions; but that the DEIS provides the information necessary to make those decisions (pp.2-87,-88). The DEIS does not clearly identify the modes of transportation. Three possible modes of transportation are identified. It poses many routes, but none are studied adequately.

- The waste could be driven on interstates using legal-weight trucks.

- It could be sent by train which includes five options of building a railroad to Yucca Mountain
- It could be transported by "Heavy Haul" which is rail to a transfer point in Nevada, then transferred to 220-foot heavy-haul trucks and transported to Yucca Mountain.

Rural areas do not have good or safe roads to transport this nuclear waste, especially, if alternative routes are selected; nor do they have railroads to get it to Yucca Mountain. As discussed in the general comments:

- The DEIS excludes information to support a decision on modes, routes, or corridors for the transportation of SNF and HLW;
- The document contains inadequate information for a decision to select any mode, route, or corridor;
- The DEIS omits essential information regarding the affected environment and the anticipated environmental impacts;
- The DEIS must specifically consider the impacts of the transportation elements of the proposed action upon the nation's and Nevada's transportation systems; and
- The DEIS must disclose that potential transportation impacts of the proposed action would be concentrated in Nevada and could result in numerous environmental impacts along the five rail corridors, the heavy haul truck routes, and I-15 in southern Nevada, as well as on alternative Nevada routes that would be used during system repair, maintenance, and construction; during weather emergencies; or for the most legal-weight truck scenario.

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- (b.) Terrorist/Extremist Threats. The DEIS inadequately provides information about terrorist/extremist threats, and used old data to provide this information. The DEIS must use current data and involve new experiments concerning modern cask response to sabotage events. The Memo to Mr. R. Halstead from "Radoactive Waste Management Associates" which has been included in Mineral County's comments for record are referenced "2. Deficient Treatment of Sabotage", pp. 6-19, see Attachment G.
- 16...
- (c.) Casks. The DOE will change the design of the casks which would transport the HLW and SNF to the proposed repository at Yucca Mountain. The DEIS does not address whether the new design of the casks has been tested and analyzed. What is the integrity of the valves, seals, and shielding of the new designed cask? (Referenced information is at Attachment A --- "Radiological Waste Management Associates" report.) Full scale cask testing is needed rather than computer simulations.
- 17
- (d.) Weather and Natural Disasters. The DEIS does not address temporary shut down due to inclement weather in Nevada, as well as other states from east, central, and northwest America. It does not have adequate information in case of road closures due to inclement weather nor provide complete information about safe havens or alternate routes for trucks and sidings for rail. On June 12, 1994, Mineral County had an earthquake with a 6.0 magnitude (extracted from an "Earthquakes in NV 1852-1996" map/char for the NV Bureau of Mines and Geology by UNR Seismological Lab.) Even if Yucca Mountain would withstand a strong earthquake, what is being done to protect the transport of the high-level nuclear waste during earthquakes, hurricanes, tornados, etc? Ongoing seismic studies being conducted for the Yucca Mountain region by the University of Nevada and seismic studies for each of the 10 affected counties should be completed before DOE makes a decision whether to recommend Yucca Mountain as a geologic repository.

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2 cont.

Other Comments. The Draft Environmental Impact Statement is inadequate with regard to addressing transportation. The DEIS should use current data to provide feasibility studies and impacts; and a comprehensive and thorough analysis of modes, specific routes, and emergency procedures in case a radioactive accident or natural disaster should occur. Transporting highly radioactive waste through 43 states (possibly affecting about 53 million people within one/half mile of the routes) is not prudent and would endanger the public and environment along these routes.

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2. <u>Emergency Response environment not described</u> - availability, training, preparedness and funding.
The DEIS must describe the availability and capability of emergency responders who would respond to transportation accidents (p3-115). There is no description of emergency response planning or capabilities nationally, statewide, or locally regarding any alternative rail corridor or transportation route.

Rural arcas do <u>not</u> have the necessary equipment, trained personnel to handle a radioactive accident, nor money to support to a radioactive cleanup. With the population increase has come an increase in use of Nevada's transportation system. Both the population increase and increase in use of Nevada's transportation system have created a higher risk for accidents all over Nevada. What precautions are being taken; or safe-havens being used, updated or built to ensure the safe transportation of the high-level radioactive waste? Emergency response capabilities must be described as part of the affected environment. Emergency services are an essential part of local public services and must not be overlooked, given the nature of the proposed project and the associated accident risks. A complete characterization of available emergency services and response capabilities must cover local law enforcement, fire, rescue and emergency medical services.

Mineral County, Nevada February 1. Comments to the Department of Energy's (DOE's) Draft Environmental Impact Statement (DEIS) for Yucca Mountain Public services information is incorrect and incomplete (p.3-115). Counties referenced only include 6 out 19 of 10 affect units of local government. The DEIS implies all small communities in Nevada contain community water, sewer services, wells or septic tanks. Small communities may provide these services; however, have very limited access to sufficient quantities of water. Also, the hospital information is incomplete and misleading since it does not describe the capabilities for 20 treating radiological or other emergency patients. Stating that public services are located in communities does not provide sufficient detail. If hospitals and other emergency services are not capable of treating injured patients involved in SNF and HLW accidents, this information must be disclosed in the DEIS. 3. Population assumptions unreasonable. Despite the recommendations of the National Research Council, 21 it seems unreasonable to assume that population in the general vicinity of Yucca Mountain would remain at its present locations and densities for thousands of years (pp5-1,-17). A more cautious approach would be to assume that future populations will be larger, more dense and closer to Yucca Mountain than today. Statistics for the population and growth of Nevada is out-dated. The population of places like Las Vegas, Reno, Carson City, and Pahrump have significantly increased. The EIS should contain this information using current data. 22 4. Affected Environment (Chapter 3). Mineral County accepts Eureka County's assessments for its comments which are provided as Attachment B. 5. Environmental Impacts of Transportation. As discussed under the general comments in this document, the DEIS fails to analyze impacts upon the national transportation system from accidents on main national 23 routes, storage of SNF and HLW on rail sidings for up to 48 hours (or longer), and routing of dedicated trains subject to speed restrictions. The DEIS must specifically describe the national transportation routes 55 over which SNF and HLW would travel, and identify the main national nodes and the numbers of shipments which would pass through them. As discussed earlier in this document the DEIS does not include Nevada transportation impacts. The 56 DEIS provides insufficient information for a decision to select any mode, route, or corridor. The generic discussion of impacts common to Nevada rail implementing alternatives (pp. 6-43 to 6-52) is excessively vague, consisting mainly of a list of possible impacts, which are then dismissed. The DEIS must specifically disclose potential environmental impacts for all Nevada routes, including alternative routes that might be used during system repair, maintenance, and construction; during weather emergencies; or for the mostly legal-weight truck scenario in accordance with the following comments: (a.) Impacts on Agriculture. The DEIS fails to analyze impacts of the proposed action on agriculture in 24 Nevada. Some residents of Mineral County depend on agriculture for their livelihoods. The BLM administers numerous grazing allotments that are leased to Mineral County ranchers. The DEIS must disclose the impacts upon Mineral County agriculture of: (1) construction and operation of access roads and railroads, (2) introduction and spread of noxious weeds, (3) increased risk of wildfire, and (4) increased risk to animals. The DEIS must address both the short-term construction impacts and the longer-term impacts upon the range. (b.) Impacts of Air Quality. The DEIS fails to analyze impacts of the proposed action on air quality in 25...

Nevada and Mineral County (pp6-9,-36). Residents and visitors of Mineral County benefit from excellent air quality conditions that could be affected by the proposed action. The DEIS says that air

emissions would affect a very large (p.6-44) but provides little or no additional information.

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The DEIS must disclose the impacts upon Mineral County's air quality from: (1) fugitive dust releases during construction and operations, (2) diesel engine emissions during construction and operations, including emissions from water trucks, and (3) increased risk of wildfire. The analysis must address visual range (i.e., haze) in addition to bulk emissions and concentrations of criteria pollutants.

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(c.) Impacts on Archeological and Ethnographic Resources. The DEIS fails to analyze impacts of the proposed action on archeological and ethnographic resources in Nevada and Mineral County (pp.6-11,-37,-47). Although the DEIS says that "Table 3-36 lists the cultural resource information currently available in each corridor", it lists only the number of recorded sites, of which there are approximately 110. Rather than saying that impacts could occur during construction and not during operations (p.6-40,-48), the DEIS must specifically disclose anticipated impacts upon archeological and ethnographic resources in Nevada and Mineral County. The analysis must consider the impacts of improved access to archeological and ethnographic sites. Additional surveys and studies are needed to identify impacts (p.6-11) and must be completed prior to a decision on a transportation mode, route, or corridor.

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6. <u>Impacts on Local Economy</u>. The DEIS does not adequately address specific community, local government, statewide, and regional impacts. Except for a discussion of the direct and indirect impacts from construction on disposable income and the Gross Regional Product, the DEIS fails to address the impacts of the proposed action on Mineral County's economy (pp6-13,-14,-37,-64). Mineral County's economy depends on mining, construction, military, transportation, agriculture and service industries (see "Hawthorne Facts at a Glance/Winter 1999" for more information about Mineral County's economy, Attachment C). The DEIS must address: (1) the anticipated impacts — positive and negative — upon the mining, construction, military, transportation, agriculture and service industries, and (2) the anticipated impacts on the agricultural economy. The DEIS must address the anticipated economic impacts of shared use of alternative routes by the DOE and by other users, such as mines.

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7. <u>Environmental Justice Impacts</u>. As discussed in the general comments, the DEIS inadequately analyzes the project impacts in relation to environmental justice. Rural communities are dispersed, rather than concentrated. Given the limited political power of rural communities, they are often targeted for unwanted projects. The Yucca Mountain repository is an excellent example of this type of "justice". The DOE's risk models are based on avoiding urban areas, and presume that risks from the project should be borne by individuals in rural communities. The DEIS should consider the effects of past programs and policies on communities, as well as additional impacts of the Yucca Mountain Project.

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8. <u>Impacts on Flood plains, Wetlands, and Surface Waters Generally</u>. The DEIS fails to adequately discuss the effects of the proposed action on flood plains and wetlands in Mineral County (pp.6-45,-61). The DEIS flood plain analysis is too general. Mineral County's flood plain map is incorrect. If this is so, how reliable is the information gathered for Yucca Mountain and other areas? The DEIS should contain a current and detailed flood plain analysis of Yucca Mountain and each of the 10 affected counties, to include transportation routes and consideration of possible radiological accidents involving surface water during flood conditions.

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9. <u>Impacts on Land Use and Community Development along possible routes</u>. The DEIS fails to adequately address the impacts of the proposed action on land use and community development in Mineral County. Mineral County (MC) will be promoting tourism. One area for tourism is hiking and outdoor activities. Another consideration for MC's land would be to have a private prison in an area close to one of the

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30 cont.

possible routes. Issues of concern to Mineral County residents include: (1) the protection of private property rights and value of land assets; (2) the fiscal, agricultural, and groundwater impacts from parcelization of land; and (3) the need to acquire land from the BLM for community expansion, to increase the amount of private land, and to erase restrictions on the use of federal lands. The DEIS fails to describe impacts on Mineral County's land use and community development, and does not evaluate whether the proposed action conflicts with its policies. The DEIS does not adequately address the potential effects that this project could have on property values within Mineral County. Since agriculture is one of Mineral County's economic producers, the nuclear stigma could affect not only property values, but also crop prices. Such stigma could stymie Mineral County's efforts to diversify the local economy, retain existing businesses, and attract new businesses to the county. The DOE seems to assume that land uses of rural communities are not significant, while land uses by federal agencies are. The DEIS must disclose and evaluate: (1) the DOE's planned use of eminent domain to take private land for transportation routes and rail corridors; (2) the effect of the proposed action on private property values, including the perceived risk and stigmatization and the effects of improved or restricted access to private property; and (3) the potential growth-effects of the proposed action, and whether it would result in additional parcelization of private land.

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10. <u>Impacts on Local Government</u>. The DEIS does not adequately address specific community, local government, statewide, and regional impacts. Also, it fails to address the fiscal impacts of the proposed action on Mineral County and other local governments (p.6-37). Mineral County has a very limited property and sales tax base, and a volatile mining economy. For these reasons it is very difficult to provide essential services and infrastructure related to fire suppression, emergency response, water and sewer, law enforcement, education, etc.; and the County would have very limited resources to defend itself against any litigation which may arise. The DEIS must evaluate the projected local revenues and expenses associated with alternative routes, considering both direct and indirect effects. Other possible impacts include: (1) fiscal impacts to local emergency response agencies, including costs of training and maintaining personnel; and (2) the fiscal effects of potential litigation related to Mineral County's emergency first response, or lack thereof, to an accident involving transportation of SNF and HLW along the proposed alternate routes.

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11. <u>Impacts on Mining</u>. The DEIS fails to evaluate the impacts of the proposed action on mining in Mineral County and neighboring counties. Mining represents a significant sector of Mineral County's economy. The DEIS must evaluate the effects of the proposed action on mining, to include: (1) possible restrictions on claimants' access to their mining claims; (2) possible physical and legal barriers to the exploitation of mineral deposits; and (3) potential benefits to mining from improved access to railroad service.

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12. <u>Impacts on Public Health and Safety</u>. The DEIS fails to adequately assess the potential public health and safety impacts of the proposed Caliente heavy-haul route and Carlin potential rail corridor and other alternate transportation routes (pp6-11,-37,-39 to -41,-49) in a number of important areas.

Transportation of SNF and HLW through areas with limited emergency response capabilities, including Mineral County and much of rural Nevada, increases the risks associated with transportation incidents. Risks are higher due to the lack of initial response capability and the time delay for responding personnel. Rural counties may choose not to respond to incidents involving SNF and HLW because of financial and personnel considerations. Jurisdictions with volunteer fire departments and other volunteer emergency responders may decide not to respond to incidents in which they cannot participate safely. The DEIS must address these scenarios.

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Discussion of transportation emergencies, emergency assistance, emergency response, and carrier and shipper responsibilities is vague, misleading, and inadequate (p.6-30). No consideration is given to local jurisdictions choosing not to respond to radiological incidents, that them may not have the capabilities to respond even if assistance and training are available, or that limited emergency response may itself create impacts. Specifically:

- * The statement that "DOE would, as requested, assist state, tribal and local governments in several ways to reduce consequences of accidents related to the transportation of (SNF and HLW)" (p.6-30) does not provide sufficient information regarding the adequacy of emergency response capabilities;
 - Although DOE may provide assistance to state, local and tribal governments, this assistance may not be adequate for necessary emergency responses;
 - There is no guarantee or assurance that DOE assistance is forthcoming.
- * The statement that "(u)nder Section 180(c) of the Nuclear Waste Policy Act, the Department would provide technical assistance and funding to train state, local, and tribal public safety officials" does not completely address the need for, or potential effectiveness of training of emergency responders; does not address whether such training is even desired by all jurisdictions; does not make it clear that the money is granted only to states; or does not even identify an amount. Potential assistance under Section 180 (c) does not constitute assistance needed to help local jurisdictions deal with transportation emergencies, and the DEIS does not analyze whether it is the only assistance needed by state, local, and tribal governments.
- * The statement the DOE would require its transportation contractors to comply with the ANSI standard for carrier and shipper responsibilities and emergency response procedures does not adequately cover the need to discuss carrier and shipper responsibilities. The reference to carriers' and shippers' responsibilities for preparation of an emergency response plan, provision of information and assistance to emergency responders, and resources for dealing with the consequences of an accident fails to analyze whether these requirements would lessen the impacts of the proposed action and any of its alternatives.
- * The discussion of transportation emergencies does not fully address the local emergency response that would be expected or required, even if federal or private response resources were available and dispatched. Also, it does not identify constraints on local emergency response or the consequences of prolonged delays due to lack of local resources.

Finally, incidents and accidents involving military aircraft and ground transportation have occurred in Nevada in the past, and could occur in the future. The DEIS does not specifically evaluate this risk.

13. <u>Impacts on Public Services</u>. The DEIS does not adequately address the impacts of the proposed action on public services in Mineral County and other counties. Mineral County provides public services such as education, libraries, public health administration, police, fire protection, etc. The DEIS must analyze the direct and indirect impacts of the proposed action on education and other essential public services. Specifically, the DEIS must address the demand on public services and associated costs. The discussion of impacts on public services of the Nevada transportation alternatives, both rail and road, is particularly inadequate regarding emergency response services. The type, capability, and availability of such services, and local government attitudes toward response to radiological incidents vary widely in the affected counties. Additional risks, costs, training, and management issues regarding emergency response must be included in the DEIS.

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and indirect impacts on fish and game.

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- 14. <u>Impacts on Recreation</u>. The DEIS fails to address the impacts of the proposed action on recreation in Mineral County and other affected counties. Mineral County residents and visitors to Mineral County rely on open spaces within the county for its unique recreation opportunities, including camping, hiking, fishing, nature study, history study, back country travel, and sightseeing. Mineral County and its neighboring counties include large unspoiled areas that could be affected directly and indirectly, by the proposed action. The DEIS must analyze the anticipated impacts of the proposed action on recreation. Specifically, the DEIS must consider the impacts of: (1) constructing and using alternate transportation routes through scenic, and open or hunting ranges; (2) restricting or improving access to
 - 15. <u>Impacts on Soils</u>. The DEIS fails to adequately address the impacts of the proposed actions on soils in Mineral County and other affected counties (pp.6-11,-37.-47). Given Nevada's arid climate, the desert soils are fragile and easily disturbed, and may not recover on their own. Compaction of access roads would increase, not decrease, erosion (p.6-47). Nevada's mines are subject to some of the most stringent reclamation requirements in the country. Reclamation is technically and financially demanding, requiring careful planning, contouring, planting, maintenance; and, in many cases, irrigation during establishment of vegetation. The DEIS must analyze the impacts on soils from constructing a raised railroad bed and access roads, including extensive cut and fill operations, to constructing additional heavy-haul roads.

back country; (3) direct and indirect damage to scenic, historical, and natural resources; and (4) direct

- 16. Impacts on Transportation. The DEIS fails to adequately address impacts of the proposed action on existing surface transportation systems in affected Nevada counties. Transportation routes to Yucca Mountain would need to be improved. These routes are important for mining, interstate commerce, and mobility of all affected county residents and visitors. Also, a network of minor roads, mostly unpaved, serves affected county residents by providing access to public lands, private property, and mining claims. The DEIS must analyze and disclose the impacts of the proposed action on the railroad and the main improved highways. Specifically, it must consider: (1) the existing capacities of road and railroad links, in terms of both weight and traffic volume; (2) the anticipated increases in utilization of those links, in terms of weight and volume; (3) the impacts of those increases on rails, pavements, road beds, and travel times; and (4) whether the proposed action would create a need or demand for additional improved routes through affected counties in Nevada. Also, the DEIS must consider the impacts on the nation's rail transport system of an accident involving SNF and HLW. In the context of the mostly legal-weight truck scenario, I-80, US 50, NV 278, NV 376 (Lander and Nye Counties). US 6 (White Pine and Nye Counties, which is close to Mineral County), and other Nevada routes could be utilized as main alternate routes for transport of SNF and HLW. The impacts of the proposed action on the existing uses of those routes must be addressed in the DEIS, in addition to I-15 in southern Nevada. Finally, the DEIS must disclose how access to minor roads would be affected and preserved.
- 17. <u>Impacts on Vegetation</u>. The DEIS fails to adequately address the impacts of the proposed action on vegetation in the affected Nevada counties (p.6-37). Noxious weeds are a major problem in Nevada and the western U.S. They threaten the livelihood of everyone who depends on the use of the range, they are easily spread by motor vehicles, and they are difficult or impossible to control once established. The DEIS must analyze the potential impacts of the proposed action on the spread of noxious weeds, during both construction and operations. Specifically, it must identify vectors that would be created or enlarged for the spread of such weeds, and the consequences of possible infestations. The DEIS must also describe the habitats and known population sites of rare and sensitive plants and identify potential disturbance during construction and operations as a result of the establishment of access to alternated transportation routes.

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Department of Energy's (DOE's) Draft Environmental Impact Statement (DEIS) for Yucca Mountain

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- 18. <u>Impacts on Water Supplies, Water Rights, and Groundwater Generally</u>. The DEIS fails to adequately disclose the impacts of the proposed action on water and water rights (pp. 6-10,-36,-61,62). The State Engineer oversees use of waters of the State of Nevada for the long-term benefit of residents. Given the arid climate and the scarcity of surface water resources, the quality and quantity of groundwater are particularly important to Mineral County and the state as a whole. The DOE must consult the State Engineer to determine whether the utilization of groundwater from wells in the Nevada affected counties (p.6-10) would be consistent with the water laws of the State of Nevada, affect the water rights of the existing holders of such rights, or affect the cost of water for domestic and agricultural use. The DEIS must also disclose the risk to groundwater resources that could be affected by a radiological accident and hazardous waste discharge associated with the proposed action on any surface transportation route. The DEIS must describe the permitting, construction, and closure of the wells, and any environmental impacts (i.e., impacts caused by drilling muds).
- 42 19. Impact to Wild and Free-roaming Horses and Burros; Endangered Species.
 - * The DEIS fails to adequately address the impacts of the proposed action on wild and free-roaming horses and burros in Mineral County. Many horses and burros inhabit the public and private range lands of the county as well as many rural counties in Nevada. They are protected under the federal Wild and Free-roaming Horse and Burro Act and are important to the residents of Mineral County and other Nevada counties. The DEIS says (under the land use heading) that the Carlin corridor would cross five management areas (p.6-60) or six management areas (p.6-62), and that land would be "converted"; but, the DEIS does not discuss the impacts. The DEIS must analyze how the construction of the proposed Carlin rail corridor (and associated fences and access roads), and related alternative transportation route improvements would affect these horses and burros.
 - * The DEIS stated the "There are no known endangered species on the Yucca Mountain site" (p.11-15). Then stated that "the desert tortoise in the only threatened species found on the site" (p.11-15). The DOE maintains it will "fulfill the requirements of the Endangered Species Act, as appropriate, with regard to transportation impacts before making the recommendation determination" (p.11-15); yet, it does not identify any endangered species along the transportation routes. The American Buffalo (Bison) which is part of our American heritage inhabit many of the lands not only in the Nevada rural counties, but also in other counties across the country. These majestic animals are an endangered species. Would they be affected and how would they be protected? The DEIS only analyzed endangered species for the YM site. The DEIS must analyze endangered species along transportation routes, to include related alternative transportation route improvements and the construction of any rail corridors, and address how these animals would be affected.

<u>Conclusion:</u> The DEIS must address direct and indirect impacts on the horses, burros, bison and and any endangered species along the transportation routes: (1) their movement and safety; (2) water supplies; (3) forage; and (4) harassment. Would the proposed action cause more damage to the range by restricting the forage for these animals?

43...

20. <u>Impacts on Wildlife</u>. The DEIS does not adequately address the impacts of the proposed action on wildlife (pp.6-10,-11,-37,-47,-60). Big horn sheep, prong-horn antelope, mule deer, mountain lions, other game, and nongame species of wildlife inhabit the rangelands and uplands of Mineral County. The DEIS says that construction of the Carlin rail corridor would result in loss and fragmentation of habitat, disrupt wildlife, and kill individual animals (p.6-47) but provides no specific information, nor discusses impacts on them or any game associated with the expansion or improvement of the associated

Mineral County, Nevada

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Department of Energy's (DOE's) Draft Environmental Impact Statement (DEIS) for Yucca Mountain

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transportation route. The DEIS must specifically address whether and how the proposed action, including railroad construction and operation, access roads and fences, and associated transportation route would: (1) fragment wildlife habitat; (2) introduce noxious weeds or otherwise affect forage; (3) interfere with wildlife migration; (4) disturb or deplete water in springs, water holes and riparian areas; and (5) increase the risk of wildfire in wildlife habitat. The DEIS analysis must be species-specific.

44...

21. <u>Impacts of the No-Action Alternative</u>. Unreasonable "No-action" alternatives - Two no-actions alternatives were provided. One would have the radioactive waste stay where it is under institutional control for just 100 years. The second would have the waste stay under institution control for 10,000 years. DOE acknowledges that neither is likely to occur but says that other scenarios would be too speculative. Reasonable alternatives should be analyzed and included in the DEIS. Mineral County accepts Eureka County's analysis for its own comments. See Attachment D (page 21 of 26 of Eureka County's comments.)

45...

22. <u>Cumulative Impacts (Chapter 8)</u>. Mineral County submits Eureka County's analysis as Mineral County's comments (see Attachment E).

46...

23. <u>Mitigation (Chapter 9)</u>. Mineral County's comments have identified many areas where the impact assessment is incomplete and inadequate, including: agriculture, air quality, archeological and ethnographic resources, environmental justice, flood plains and wetlands, land use and community development, local government, mining, public health and safety, public services, recreation, soils, transportation, vegetation, water, wild horses and burros, endangered species, and wildlife. Since impacts in these areas have not been fully disclosed, the discussion of mitigation is also inadequate.

Pending a complete and thorough analysis of the transportation impacts of the proposed action, a required mitigation list is difficult to prepare. However, based on Mineral County's comments to date, that mitigation must be included at least for:

- * Reductions in the size, number, and productivity of federal grazing allotments;
- * Emissions of fugitive dust, diesel particulate, and smoke from fires caused by the construction and operations on the improvement of alternative routes;
- * The spread of noxious weeds, which may adversely affect agriculture, other vegetation, wild horses and burros, bison, and wildlife;
- * Direct and indirect damage to archeological and ethnographic resources;
- * Economic impacts on the mining, construction, services, and agricultural sectors of the economy;
- * Environmental justice impacts on residents of rural areas;
- * Damage to wetlands and changes in the boundaries of the flood plains from large storms;
- * Radiological risks to the public along transportation routes;

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Comments to the

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Department of Energy's (DOE's) Draft Environmental Impact Statement (DEIS) for Yucca Mountain

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- * Damage or displacement of public infrastructure during rail corridor construction and related alternative transportation improvements;
- * The taking of private property; reduced private property values due to perceived risk and stigmatization; reduced private property value due to restrictions on access; and fiscal, agricultural, and groundwater impacts caused by accelerated parcelization of private property;
- * Direct and indirect fiscal impacts on Mineral County and other local governments;
- * Restrictions on legal or physical access to mining claims and mineral deposits;
- * Direct and indirect impacts on the provision of education and other essential public services;
- * Recreational impacts from construction on the improvements of railway lines and alternative routes, as well as impacts caused by improved access to the back country and wildlife habitat;
- * Adverse impacts on the existing surface transportation systems, including the Union Pacific railroad, I-80, US 50, NV278, NV 306, NV 376, and minor roads that provide access to private property, public lands, and mining claims;
- * Direct and indirect impacts on rare and sensitive plants and their habitats;
- * Direct and indirect impacts on wild horses, burros, and bison, including their forage, water, movement, and safety; and
- * Direct and indirect impacts on designated riparian habitats and wildlife generally, including impacts from fragmentation, noxious weeds, interference with migration, disturbance or dewatering of water sources, and increased risk of wildlife.

47...

Mitigation Related to Emergency Response and Management. Mitigation measures for impacts to local governments for emergency response and management activities made necessary by the proposed action (including the transportation alternatives) are incomplete or absent. Local emergency response resources will typically be the first on the scene of any accident involving the transportation of SNF and HLW. The DOE's National Transportation Program publication, "Transporting Radioactive Materials, Answers to Your Questions" (June 1999, p.24), says "As with any traffic accident, the local, Tribal, and State police, fire departments, and rescue squads are the first to respond to transportation accidents involving radioactive materials." Chapter 9's introduction (p.9-1) tries to head off any discussion of specific mitigation actions for emergency response services and emergency management actions. This discussion is based on and over-simplified reference to Section 116(c) of the Nuclear Waste Policy Act. Although this section may help mitigate impacts to public health and safety, it does not constitute the universe of mitigation measures for public health and safety.

The DEIS must examine all relevant mitigation measures, including mitigation of ongoing impacts over the life of the proposed waste shipments.

The discussion of occupational health and safety (p.9-23) excludes mitigation to reduce the impacts from waste shipment transportation accidents. To adequately prepare for potential accidents, an

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estimate of the real costs of remedying such an accident is essential. This assessment must include the following: emergency costs (to include all phases of emergency management, including preparedness, response and recovery or the lack of local emergency response capabilities in rural counties; and programs, funding and training should be addressed), surface cleanup costs, decontamination costs (roadways, buildings, groundwater, surface water, etc.), hospital costs to injured parties, lost workdays due to contamination, economic losses due to fear of contamination, loss of tourism, evacuation costs, relocation costs, contaminated food embargo costs, insurance costs, legal costs, governmental costs, etc. Emergency costs mitigation could include dedicated emergency response teams (not local government teams) which would be immediately available within a short response time to the scene of a radioactive accident. These teams might travel in conjunction with, but at a distance from SNF and HLW shipments, or they could be strategically stationed and equipped for quick initial response. This would be effective mitigation where few or no local emergency resources exist.

Baseline Health Assessment and Compensation Fund. The mitigation program must include a special escrow fund for prompt and complete compensation of affected individuals by radioactive accidents along transportation routes. Mineral County's, as well as other affected counties', primary responsibility in relation to the proposed Yucca Mountain Project is to protect the health and safety of their residents. Upon initiation of the proposed action, the DOE should conduct a baseline health assessment of anyone within a reasonable region of influence from the transportation routes which will be used. All claims should be evaluated against the baseline assessment and paid promptly from an escrow fund set up in advance of transportation, and fully funded from the start to the completion of the project. Citizens exposed to radioactivity from a nuclear transportation or handling accident would be ensured of compensation. This fund should be established through an independent third party, with an initial endowment of \$1 billion. Furthermore, victims should not have to litigate to get compensated for their medical expenses, loss of livelihood, and other damages resulting from exposure.

The Price-Anderson Act does not provide the needed coverage. Its funding is limited, and depends upon a future session of Congress to provide additional funds. Mineral County can not depend on future generations of lawmakers to provide for victims of the proposed action. Thus, a special funding source should be part of the mitigation for the project.

Conclusion

| 48 | (1) The cost of clean up at the Nevada Test Site, cost to build new routes (rail or roads), cost |
|----|---|
| | to ensure precautions are being taken, cost to train emergency response staff, cost to clean up |
| | a radioactive accident, and cost to mitigate would probably far exceed finding alternative |
| | ways to reuse this radioactive waste. The EIS has an inadequate analysis of the costs. It |
| | should include analysis of the eventuality of the waste at Yucca Mountain; funds to monitor |
| | it, costs of drip shields, back fill, leaks and repair; and mitigation costs. |
| 49 | (2) A "health assessment" (at the cost of DOE) should be done now of all 10 affected |
| | counties. This assessment would reflect what is out there now. By showing the present |
| | health situations now, a case may be made for not adding to a potential number of latent |
| | cancer fatalities, and for documenting current health conditions prior to a radioactive waste |
| | accident; and |
| 50 | (3) The radioactive waste should not be buried because there is no way mankind can predict |
| | what will happen in the future. Alternative ways should be studied so technology can find a |
| | way to reuse this radioactive waste. Burying something as deadly as radioactive waste does |

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Comments to the

Mineral County, Nevada

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Department of Energy's (DOE's) Draft Environmental Impact Statement (DEIS) for Yucca Mountain

50 cont.

not solve any problems. If anything it might create more problems. Thus, a reasonable noaction alternative is preferred until technology can provide a better way of eliminating SNF and HLW. Consequently, the DEIS is inadequate in so many respects, especially with respect to its transportation elements, the DOE must issue a new, revised DEIS and give the public new opportunities to comment, including public hearings. Minimally, the revised DEIS must address all of Mineral County's comments regarding Chapter 6, transportation-related impacts and Chapter 9, Mitigation.

C: SUMMARY AND REQUIRED ACTIONS

51... 52...

Mineral County endorses Eureka County's Summary and Required Actions (see Attachment F).

Radioactive Waste Management Associates

Memo

To:

R Halstead

From:

M Lamb and M Resnikoff

Date:

01/21/00

Re:

Comment Summary - Yucca Mtn Draft EIS, Expanded version

16 cont.

1.2. Use of "reference cask" containing a water jacket neutron shield

The Modal Study used as its reference cask one using a water neutron shield. This shield was assumed to evaporate in event of fire. The resulting dead air space was modeled to cut the heat transfer rate into the cask by over 70% (Modal 6-36). Given a 1475°F fire transferring heat at a rate of 17,000 BTU/hr-ft², this had the effect of reducing the heat actually absorbed by the cask to 5,000 BTU/hr-ft². This reduction was assumed when the melting times were calculated. However, newer casks no longer use water jackets, and the thermal insulation device assumed in the Modal Study is no longer present. Therefore, the heat transfer rate absorbed by the cask is expected to be much closer to the thermal output from the fire itself, since it cannot be assumed without testing that the polypropylene shield will behave like a water jacket. Since the time to reach lead melt is proportional to the rate of thermal input, the absence of the dead air insulator would have the effect of reducing the time required to melt the lead shielding from 1.09 hours to about 20 minutes. (Audin, 18) For the uranium and/or stainless steel shield, this means quicker increases in temperature than those postulated by the Modal Study, resulting in a reduction in the fire severity needed to cause a given accident condition.

1.3. "Lead cask bias" used to select most appropriate measurement parameter

The decision to use strain on the inner cask wall as the primary measure of cask response is based on lead's tendency to "slump" when subjected to high loading, resulting in high strains on inner cask wall. However, uranium and/or stainless steel are strong and rigid and thus will not slump. Rather, the force from impacts will be transferred to the joints and welds of the cask, likely resulting in a greater force being applied to them than those in a lead cask. The choice of strain as the sole measurement parameter for physical duress will likely lead to an underestimation of the damage caused to newer casks through rupture of welds and seals in the event of an accident. Therefore, new experiments must be performed to model this behavior.

C. Affected Environment (Chapter 3)

EIS001660

Justification lacking for regions of influence. The descriptions in the DEIS of the affected environment and the anticipated impacts utilize a list of "regions of influence." (pp. 3-2, 3-10, 3-79, 3-98, 3-101) However, the DEIS provides little or no justification or explanation regarding the definitions of these regions. For such an unconventional project, with such great risks, the DOE must consider the regions of influence carefully and draw them broadly. Specifically, the 80-km radius around Yucca Mountain, which defines the region of influence for air, climate, and health and safety (p. 3-3) is unsupported, appears to ignore information on prevailing winds and atmospheric transport, and prevents a full evaluation of the repository's air quality impacts on the Las Vegas Valley. The limitations on the air quality, climate, cultural resource, and health and safety regions of influence for rail corridors are also unsupported and inappropriate.

"Affected units of local government" not accurately defined. The DEIS says that "affected units of local government include county governments near the potential repository site and along potential transportation routes within Nevada." (p. 3-1) Appendix C says, "As defined by the NWPA, the affected units of local government are local governments (counties) with jurisdiction over the site of a repository." (p. C-9) Neither definition is accurate. DOE has interpreted Section 116 of the NWPA as amended to mean that the affected units of government are Nye County (the situs county) and the nine counties contiguous to Nye County. The definition on p. 3-1 is misleading because there are Nevada counties along potential transportation routes that are not considered "affected" counties under the NWPA, e.g., Elko County. The definition on p. C-9 is misleading because it is circular. Finally, the DEIS should acknowledge the special legal status of "affected units of local government" under the NWPA.

<u>Environment affected by transportation not described</u>. The fact that the DEIS requires less than two pages to describe the environment that would be affected by the national transportation elements of the proposed action and by the mostly legal-weight truck scenario in Nevada illustrates the complete inadequacy of the DEIS in this regard. (pp. 3-98, -99) For a long-term,

Eureka County Nuclear Waste Office --

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unconventional activity that could very seriously affect the vast majority of the states and a large percentage of the population of the United States, the DEIS tells nothing about the affected environment other than the broadest of generalities.

The land use descriptions for the rail corridors in Nevada are inadequate. (p. 3-101 to -103) The land use regions of influence are narrowly drawn (limited only to disturbed lands and changes in ownership), and the *only* information provided for the Carlin corridor (for example) is the amount of public and private land. Although the DEIS says that "detailed information on land use is available" in other documents, it fails to describe their contents even briefly, as required by 40 CFR 1502.21.

Attachment B

The socio-economic descriptions for the environment that would be affected by rail corridors in Nevada are equally inadequate. The DEIS does not contain a complete or accurate description of baseline socioeconomic information for the affected counties. For example, the socio-economic description of Eureka County discloses only: the average unemployment rate, per capita income, population, and population density for a single year, projected population for the year 2000, and the total and occupied numbers of housing units. (pp. 3-114, -115) The DEIS should discuss Eureka County's demographic data, economic drivers and trends, local fiscal conditions, cost of living, work force issues, and economic development plans. An example of a more adequate socio-economic description can be found in the South Pipeline Project Draft Environmental Impact Statement (U.S. Department of the Interior, Bureau of Land Management, August 1999), at pp. 4-181 to 4-211.

Since the DOE says that the DEIS is adequate to support a decision on transportation modes, routes, and corridors, the concerns of Eureka County are especially great. The DEIS implies that the affected environment is sparsely populated, lightly used, and not important. To the contrary, the resource-based economy of Eureka County and other Nevada counties depends almost entirely on the land and its mineral and biological resources.

Attachment B (Page 2)

HAWTHORNE FACTS AT A GLANCE / WINTER 1999

A Publication of Sierra Pacific Power Company's Economic Development Department



MINERAL COUNTY

Mineral County is in Nevada's interior, where a true "Nevada atmosphere" combines western flavor with an excellent business climate. Mining communities and ghost towns – some dating back to the 19th century – dot the county. Aptly named, Mineral County contains rich deposits of gold, silver, copper, tungsten, iron, coal, borax, lead and a variety of gemstone rocks.

Mineral County is an excellent place to do business because of its:

Unlimited rural expanses and outstanding recreational opportunities

- · Attractive, moderate cost of living
- Mild climate
- Excellent location and transportation network
- Quality schools and educational environment, including a branch of the Western Nevada Community College
- Favorable, pro-business tax structure (Nevada has no personal or corporate income taxes, no inventory taxes and no estate/inheritance taxes, just to name a few.)
- Ample industrial and residential land.

This brief business portrait of the Hawthorne/Mineral County area provides you an easy reference to the many advantages that our area offers companies, individuals and families.



Beautiful Walker Lake is home to a variety of activities including boating, water-skiing, windsurfing and fishing year round.

A BRIEF BUSINESS PORTRAIT OF HAWTHORNE, NEVADA

When you're thinking of expanding or relocating your business to a new area, the choices can be overwhelming. It can be a challenge just collecting the information you need to make a decision.

"Hawthome Facts at a
Glance" consolidates the latest
available statistics to give you
information relevant to your
decision, including the
business and lifestyle advantages of Hawthome, Nevada.
It is published annually by
Sierra Pacific Power
Company's Economic
Development Department.

After you do all the necessary research, study and travel and you're ready to make a decision, remember...
Hawthorne —

The Perfect Combination of Western Hospitality and an Inviting Business Climate

LOCATION & TRANSPORTATION

Hawthorne is located in west central Nevada, 132 miles southeast of Reno and 311 miles northwest of Las Vegas at the intersection of U.S. Highway 95 and State Route 359. At an elevation of 4, 255 feet, Hawthorne is situated in the high desert, approximately five miles southeast of Walker Lake. Hawthorne's central location and easy accessibility provides excellent transportation advantages to business and industry.

TRUCKING

U.S. Highway 95 runs through Hawthorne, linking the area with Reno to the north and Tonopah/Las Vegas to the south.

RAIL SERVICE

Access to freight service is provided by Union Pacific Railroad.

BUS SERVICE

K-T Bus Service stops twice a day in Hawthorne seven days a week, providing daily transportation to Reno and Las Vegas.

AIRPORT

The Mineral County Airport facility offers a 4,800-ft. lighted runway. No tower facilities are available.

CLIMATE

Hawthorne's high desert location ensures mild local weather since the surrounding mountain ranges protect it from effects of Pacific storms. To the west is the Wassuk Range, capped by beautiful 11,239-ft. Mt. Grant. To the northeast the Gillis Range peaks span from 5,000 to 7,000 ft. These mountain ranges, as well as the nearby Garfield Hills and the Sierra Nevadas, are "protectors" of Hawthorne's weather. Temperatures are relatively mild in the winter and warm during the summer. The sun shines an average of 80 to 85 percent each year.

| Ć | LIMATE INFORMATION | |
|-----|---------------------------------|-----------|
| 100 | Avg. Temp55.1 F | 1 |
| 4 | January Avg. Temp 34.9 F | |
| Ě | July Avg. Temp | W. 254.78 |
| 2 | Avg. Annual Precip4.58 inches | 0.00 |
| | Avg. Growing Season 22.135 days | |
| 9.7 | entral control of | ě |

ECONOMY

Delta Star, a major electrical transformer manufacturer, plans on building a facility in the summer of 1999 at the Hawthorne Airport Industrial Park.

The Hawthorne Army Ammunition Depot (operated on contract by the Day/ Zimmerman Hawthorne Corporation) brings \$25 million annually into the local economy.

Tourism is also a major industry, with Hawthorne a convenient stopping place for travelers. Many outdoor enthusiasts are attracted to the numerous recreational opportunities at Walker Lake.

PROPERTY TAX

The 1998-1999 ad valorem property tax in Hawthorne and Mineral County is \$3.64 for each \$100 of assessed value. Assessed value is 35 percent of the current market value of the property.

BUSINESS TAX

All businesses that operate within the state must obtain a business license and pay a one-time \$25 filing fee. Businesses must file a tax return and pay state business tax which is due on the last day of the calendar quarter. The tax is computed at \$25 per full-time employee per quarter that worked in Nevada.

Partial Exemption From Nevada Business Tax

A new business may qualify for a partial exemption if authorization is obtained from the Nevada Commission on Economic Development. The firm's business activity must be consistent with the Commission's plans for the economic development of counties with a population less than 35,000, and the business must:

- Have 25 or more full-time employees by the fourth quarter it's in operation
- Make a capital investment of \$250,000 or more in Nevada

A variety of exemptions are available as incentives.

Note: It is necessary to apply for the exemption.

SALES AND USE TAX ABATEMENT

Mineral County's sales and use tax is 6.5 percent. However, qualifying companies can avoid paying all but 2 percent on the purchase of capital equipment. To qualify, relocating companies must have 10 employees and commit to staying in Nevada for at least five years. An expanding local company must hire 10 new employees. Companies must also pay workers at least the statewide average hourly wage of \$13.37 per hour.

POPULATION:

Current Population Distribution by Age Mineral County

| Under 5 | 6.7% |
|-------------------|-------|
| 5-19 years | 23.4% |
| 20-24 years | |
| 25-44 years | |
| 45-54 years | 11.9% |
| 55-64 years | |
| 65-74 years | 9.5% |
| 75-84 years | 4.9% |
| 85 years and over | |
| • | |

GROWTH TRENDS

| | | Mineral | |
|------|--------------------|---------|-----------|
| Year | Hawthorne | County | Nevada |
| 1980 | 5,166 | 6,217 | 800,508 |
| 1990 | 5, 44 0 | 6,470 | 1,236,130 |
| 1995 | 5,027 | 6,700 | 1,582,390 |
| 1996 | 3,601 | 6.810 | 1,688,140 |
| 1997 | 3,630 | 6,860 | 1,779,850 |
| | | | |

IVX STRUCTURE:

Taxes in Nevada are among the lowest in the nation. Nevada ranked third in the "Top Ten Tax Havens" in the United States according to *Money* magazine's January 1995 survey.

- No personal income tax
- No unitary tax
- No corporate income tax
- No inventory tax

Selected Taxes Imposed by Western States

| STATE | CORPORATE INCOME % | PERSONAL INCOME % | SALES AND USE % | PROPERTY |
|------------|--------------------|----------------------|--------------------|----------|
| Arizona | 9.0 | 2.9-5.17 | 5.0 | Yes |
| California | 8.84 | 1.0-9.3 | 7.25 | Yes |
| Colorado | 5.0 | 5.0 | 3.0 | Yes |
| Idaho | 8.0 | 2.0-8.2 | 5.0 | Yes |
| Montana | 6.75 | 2.0-11.0 | None | Yes |
| Nevada | None | None: | 6.5 * | Yes |
| New Mexico | 4.8-7.6 | 1.7-8.5 | 5.0 | Yes |
| Oregon | 6.6 | 5.0-9.0 | None | Yes |
| Utah | 5.0 | 2.3-7.0 | 5.75 | Yes |
| Washington | None | None | 6.5 | Yes |

It his chart shows that even among Western states, Nevada offers substantial tax advantages.

ETHNIC CHARACTERISTICS

| Asian & Pacific Islanders | 1.1% |
|---------------------------|------|
| Black | 5.5% |
| Caucasian | |
| Hispanic | 9.3% |
| Native American | |

EDUCATION LEVELS

| High School Graduate | 73.1% |
|-------------------------------|-------|
| Four or More Years of College | |
| Median Years of | |
| | |

School Completed12.1 years

LABOR FORCE

The Mineral County labor-force is employed primarily in mining, construction, military, transportation, agriculture and service industries. The available work force is committed, skilled and versatile, with experience in adapting to the changing needs of business.

PER CAPITA INCOME

| 1995 | 1996 | 1997 |
|----------------------------|----------|----------|
| Mineral Co. \$20,747 | \$22,071 | N/A |
| Nevada \$24,525 U.S. | \$25,876 | \$26,553 |
| \$23,063 Far West | \$24,169 | \$25,298 |
| \$23,753 | \$24,901 | \$26,061 |

| LABOR MARKI | ET | |
|----------------|--------------|-------|
| 1996 | 1997 | 1998 |
| Total Labor Fo | orce | |
| 2,650 | 470 | 2,430 |
| Total Employ | ment | |
| 2,460 | 1164 380 - 5 | 2,270 |
| Total Unempl | oyment | |
| 190 | 140 | 160 |
| Unemploymer | nt Rate | |
| 7.2% | 288 | 6.4% |

FINANCIAL INSTITUTIONS

To meet the banking and other financial needs of your business, Hawthorne is home to the following financial institutions:

- Bank of America
- Hawthorne Credit Union

COMMUNITY RESOURCES

EDUCATION

Mineral County School District (775) 945-2403 Fax: (775) 945-3621 Elementary Schools 3 High Schools 1 Enrollment (October, 1998) Hawthorne 617 High School 254 Mina K-4 7 Schurz 7

K-8......135

Western Nevada Community College

P.O. Box 716 10 21st Street Hawthorne, NV 89415 (775) 945-2405 Fax: (775) 945-3621

Western Nevada Community College offers many courses that are carefully planned to appeal to the area's diverse population. Ninety-five percent of the facility's credits are transferable to the University of Nevada.

CHURCHES

| Roman Catholic | 1 |
|-------------------|----|
| Latter-Day Saints | 1 |
| Protestant | 10 |
| Other | 5 |

CLUBS AND ORGANIZATIONS

Twenty-eight clubs and organizations provide opportunities for social, recreational

EMPLOYMENT DISTRIBUTION BY INDUSTRY 1996 1997 1998 Base(1) 100.0% Total Industries2,400 2,360 2,240 Construction 80 -30. 1.8% 40 Finance, Insurance and Real Estate.....40 40 40 1.8% Government 600 590 590 26.3% Manufacturing 10 10 10 0.4% ·*- 350 250 11.2% 1,080 1,080 48.2% 250° 230 10.3% Transportation and Public Utilities......20 - 20 20 0.9% (1) The percentages in this column are based on March 1998.

"Mineral County is prepared to do business. We have a professional Economic Development Authority for immediate assistance, an intelligent and dedicated work force, low taxes, available land, a high quality of life and much, much more."

Mineral County Economic Development Authority and community service activities with community members who share common interests.

CONVENTION FACILITIES

 Hawthorne Convention Center–227 person capacity, full kitchen and lobby area.

LOCAL EVENTS

- Walker Lake Fishing Derby

 February
- Walker Lake Migratory Bird Festival–April
- Armed Forces Day (Parade, HwAAP Open House)

 –May
- Walker Lake July 4th Celebration
- Walker Lake Earth Festival— September
- Walker River Pinenut Festival
 September
- County Fair & Rodeo-September
- Fisherman's Holiday Fish Derby-November

MEDIA

- Mineral County Independent News (Local Weekly Newspaper)
- · Reno Gazette-Journal (Daily)
- TCI Cablevision of Nevada, ABC, CBS, NBC and Fox network channels, available from Reno.
- KWI TV13 Hawthorne

PUBLIC SERVICES

| Sheriff's Office |
|----------------------------|
| Sworn Officers24 |
| • Volunteers4 |
| Fire Department |
| • Full-time Personnel4 |
| Volunteer Fire Personnel12 |
| |

SENIOR CITIZENS' RESOURCES

Senior Citizens' Center Services

- Hot Lunches
- · Meals On Wheels
- 41 Senior Housing Units

SHOPPING AND LODGING

Hawthorne has commercial services including a modern supermarket, clothing stores, hardware stores and many fine restaurants. Over 270 hotel/motel rooms are available.

OTHER RESOURCES

- Mineral County Public Library
- Mineral County Museum

HOUSING

A wide range of housing is available in Mineral County, including single-family homes, apartments and mobile homes.

HOUSING COSTS

The cost of a typical 1,150 square-foot, single-family dwelling in the Hawthorne area is \$65,000.

Average rent for a two-bedroom unit in a multi-family complex is approximately \$350/month.

MEDICAL & HEALTH SERVICES

Mount Grant General Hospital

(775) 945-2461

Fax: (775) 945-2359

This 35-bed facility offers a 24-hour emergency room, acute care and extended care services. The medical staff consists of one general surgeon and four family practice physicians. Laboratory, radiology and CT-scan services.

Other Medical Resources

| Clinics | , l |
|------------------------------|-----|
| Dentists | l |
| Medical Doctors | 5 |
| Nursing Homes | 1 |
| Pharmacies | |
| Physician's Assistant | 1 |
| Public Health Service Office | 1 |
| Rural Health Clinic | |
| | |

UTILITIES

Electricity

Sierra Pacific Power Company

LP Gas

AmeriGas Tippin Gas

Water/Sewer/Garbage

Hawthorne Utilities

Telephone

Nevada Bell AT&T

RECREATION & ENTERTAINMENT

- Auto/BMX Race Tracks
- · Baseball/Softball Fields
- Berlin Ichthyosaur State Park
- · Bowling Alley
- Camping
- Country Club with nine-hole Public Golf Course
- Ghost Town Exploration (Aurora, Beatty, Bodie, Candelaria, Marietta)
- Hiking
- Movie Theater
- Municipal Swimming Pool
- Public Parks
- Rock Hounding
- Tennis Court
- · Walker Lake (boating, cutthroat trout

fishing, water-skiing, windsurfing)
• YCAC (Young Citizens Activity Center)

ECONOMIC DEVELOPMENT AUTHORITIES

Sierra Pacific Power Company

This Facts At A Glance is one of a variety of publications available to you produced by the Economic Development Department of Sierra Pacific Power Company.

Sierra Pacific is an investor-owned, diversified energy and resource corporation engaged in pursuing related business opportunities in a rapidly expanding regional economy.

Sierra Pacific's Economic Development Department offers site assistance that will make your relocation or expansion easier. Its computerized Industrial Properties Database and Resource Center are designed to provide accurate and up-to-date information. All inquiries are kept confidential.

Sierra Pacific Power Company Economic Development

Chris Barrett, Manager 6100 Neil Road P.O. Box 10100 Reno, NV 89520-0024 (775) 834-3636 Fax: (775) 834-3384 (800) 824-8856 E-mail: cbarrett@sppc.com www.sierrapacific.com/econdev

MCEDA

The Mineral County Economic Development Authority (MCEDA) is a nonprofit entity that helps businesses find properties for commercial and industrial use. MCEDA works closely with local and state agencies to encourage the economic development of Mineral County and can provide listings of available properties, business statistics, demographics and information on the area's financial resources.

Industrial Parks/Land

Industrial park and commercial development land are available for lease, purchase and build-to-suit. For information on specific parcel availability and terms, or to find out more about the business opportunities Hawthorne has to offer your company, call or write:

Mineral County Chamber of Commerce Economic Development Authority

P.O. Box 1635

Hawthorne, NV 89415 (775) 945-5896 or 945-0705

Fax: (775) 945-1257

E-mail: info@mcchamber.hawthome.nv.us www.greatbasin.net/~mcchamber

Researched and produced by Sierra Pacific Power Company's Economic Development Department, February 1999.

GMAA 13732 2/99 DG 2.5M

<u>Limitation on scope of analysis inappropriate</u>. Although the DEIS says that the same spectrum of environmental impacts was considered for the no-action alternative as for the proposed action, it also says (in the same paragraph) that DOE decided to focus the no-action analysis on the health and safety of workers and members of the public. (p. 7-6) This limitation on the scope of the no-action analysis is inappropriate. It rules out any meaningful comparison with the impacts of the proposed action.

Also, the implication (p. 7-7) that the proposed action does not affect the 72 commercial and 5 DOE facilities and their surrounding environments, but the no-action alternative does, is not true. Obviously, both alternatives would result in environmental impacts at all the sites.

44 cont.

Analysis of no-action alternative inconsistent and biased. Despite statements to the contrary, the analysis of the proposed action and the no-action alternative is not consistent. (See pp. 7-9, -16) The statement on p. 7-9 that Chapter 3, section 3.3, discusses the conditions at the sites that formed the basis for identifying impacts of the no-action alternative is not true. The statement on p. 7-11 that the Yucca Mountain workforce would lose their jobs under the no-action alternative is unsupported and alarmist; it reflects bias. The statement on p. 7-12 that payments in lieu of taxes would be diminished under the no-action alternative is unsupported. The analysis of in-lieu payments should address both costs and revenues. The statement on p. 7-46 that concentrations and areas affected by radiation from Module 1 would be impossible to estimate is untrue on its face.

Attachment D

H. Cumulative Impacts (Chapter 8)

45 cont.

<u>Analysis of shared rail use inadequate</u>. The analysis of the impacts of shared public/private use of DOE branch rail lines is inadequate. (pp. 8-4, -15) The analysis properly belongs in Chapter 6, Transportation Impacts. The statement that predicting increases in rail traffic from shared use would be difficult and, therefore, is not done is unacceptable. The DEIS says there will be impacts, and they must be analyzed, disclosed, and mitigated as necessary. (p. 8-87)

<u>Analysis of impacts on public services inadequate</u>. The DEIS does not adequately address cumulative impacts on emergency response services. The DEIS says that cumulative operations impacts would result because of the extra 14 years of shipping required for Modules 1 or 2 (p. 8-85), but that the DOE expects no cumulative socioeconomic impacts. This conclusion is contradictory and improbable since state, local, and tribal government emergency services would continue to be impacted.

Other comments. The failure of Congress to ratify the Nuclear Test Ban Treaty makes the future resumption of nuclear weapons tests more likely. (pp. 8-3, -11, -12) The statement that interim storage was not analyzed for cumulative impacts because it is uncertain is inappropriate; it is reasonably foreseeable and must be included. (p. 8-5) The inadequacies of the air pollution analysis are similar to those in Chapter 4: the discussion is vague and the conclusions unsupported by the evidence, particularly the statement that there will be no effect on the Las Vegas Valley air basin. (pp. 8-24 to 8-30) The statement that the final EIS will review new information from the Pipeline Southeast Expansion Project for cumulative impacts is unacceptable, since the public will not have the opportunity to comment (p. 8-85).

III. SUMMARY AND REQUIRED ACTIONS

The DEIS is inadequate to support a decision on modes, routes, or corridors for the transportation of SNF and HLW to Yucca Mountain. It omits essential information regarding the affected environment and the anticipated environmental impacts, particularly for the national transportation routes and for transportation within Nevada.

Although the DOE says it does not know when it will make the transportation decision, transportation is integral to the project and must be fully covered in the DEIS. <u>Disclosure of transportation impacts must not be postponed</u>, and future decisions must not rely on the sketchy, inadequate information in the DEIS.

The DEIS is confusing and, therefore, misleading as to the future generation of SNF and HLW. If the DOE proposes to close all commercial nuclear power plants by a certain year, this must be explicitly stated as part of the proposed action.

The DEIS must include a realistic no-action alternative, and evaluate that alternative fairly, using consistent assumptions. The environment that would be affected by the no-action alternative must be specifically described.

For the various impact areas, <u>DOE</u> must carefully reconsider the regions of influence and draw them broadly, to reflect the unique nature and vast risks of the proposed action.

The DEIS must then re-analyze and disclose the environmental impacts of the proposed action, particularly its transportation aspects, and define appropriate mitigation measures when a thorough analysis is completed. In any event, the mitigation program must include a baseline health assessment and a special escrow account to compensate victims of radioactive exposure along transportation routes. It must also include a thorough analysis of:

- Required emergency response capabilities for the range of potential transportation accidents and incidents;
- Available emergency response services and capabilities along transportation routes, nationwide and in Nevada, including alternative modes and routes;
- Impacts of the transportation impacts of the proposed action on state, local, and tribal emergency response services and resources; and
- Required project-specific emergency response planning, capabilities, and services; carrier and shipper procedures and services; and federal resources, capabilities, and response.

Since the DEIS is inadequate in so many respects, especially with respect to its transportation elements, the DOE must issue a new, revised DEIS and give the public new opportunities to

Eureka County Nuclear Waste Office --

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comment, including public hearings. At a minimum, the revised DEIS must address all of Eureka County's comments regarding Chapter 6, transportation-related impacts, and Chapter 9, mitigation.

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Board of

MINERAL COUNTY COMMISSIONERS

JACKIE WALLIS, Chairman

DAN DILLARD, Vice Chairman

ARLO K. FUNK, Member

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FAX 775-943-0706
P.O. Box 1450
Hawthorne, Nevada 89415

GOVERNING BOARD FOR THE TOWNS OF HAWTHORNE, LUNING AND MINA

LIQUOR BOARD

GAMING BOARD

February 1, 2000

Memorandum for Record

Mr. Halstead is an individual who is noted for his technical expertise. He would not endorse anything without it being accurately reported. Thus, The Mineral County Board of Commissioners concur with and completely accept the findings on the attached report, and wants this report included in Mineral County's written comments for the DEIS and to be put on record.

Jackie Wallis,

Chairman,

Mineral County Commissioners

elo Tunk

Dan Dillard

Vice Chairman

Mineral County Commissioners

Arlo Funk Member

Mineral County Commissioners

··· Attachment G

Radioactive Waste Management Associates

Memo

To: R Halstead

From: M Lamb and M Resnikoff

Date: 01/21/00

Re: Comment Summary - Yucca Mtn Draft EIS, Expanded version

Summary

1

After reviewing DOE/EIS-0250D, Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (July, 1999), with emphasis on the transportation of spent fuel to the proposed repository, a number of questions have been raised which need answer. Below is an outline summarizing some of the key deficiencies of the EIS. Many of the comments listed below follow a central theme: the EIS uses outdated experimental data and improper mathematical models to arrive at unbelievable estimates of health consequences due to incident-free transportation and accident scenarios. No new experiments have been performed to assess shipping cask response to postulated accident conditions or sabotage scenarios, even though the current generation of casks bear little resemblance to the casks used in experiments cited by the current EIS. No new estimation of the frequencies of severe accidents is made, even though rail and highway conditions, such as speed limits, have changed since the cited studies were performed. Computer models estimating release fractions in a terrorist strike are used which cannot properly model the casks involved. When the deficiencies in the EIS's treatment of transportation are assessed, it becomes clear that new experimental studies are necessary to provide a realistic assessment of the costs of transportation. These new experiments must involve an updated Modal Study, new experiments concerning modern cask response to sabotage events, and new traffic surveys estimating the frequency of severe accidents. In addition, the inadequate treatment of transportation in this analysis points to the glaring need for NRC to perform an updated EIS on the transportation of spent nuclear fuel. The outlined points below are just brief summaries, and detailed analyses of each point will be provided at a later date.

1. Use of data from the Modal Study to estimate accident severities and probabilities of severe accidents

1.1. Use of "mid-lead" temperature as parameter determining accident severity

- 1.1.1. Lead (MP 621°F) will stabilize the inner core temperature in the event of a fire until it is completely melted. This has the affect of insulating the inner core from temperature increases for an extended period of time. Uranium and/or steel, with a much higher melting point, will not melt, resulting in an inner core temperature that will rise constantly with heat input. Therefore, inner cores of newer casks are expected to have higher temperatures during a fire of a given intensity.
- 1.1.2. The use of mid-lead temperature results in grouping of all fires with temperature greater than 1050°F into one consequence category, since lead-nickel alloying occurs here, weakening the integrity of the older casks. Since uranium and/or stainless steel will behave differently under temperature duress, new classifications based on its properties must be used for categorizing fire intensities.

1.2. Use of "reference cask" containing a water jacket neutron shield

The Modal Study used as its reference cask one using a water neutron shield. This shield was assumed to evaporate in event of fire. The resulting dead air space was modeled to cut the heat transfer rate into the cask by over 70% (Modal 6-36). Given a 1475°F fire transferring heat at a rate of 17,000 BTU/hr-ft², this had the effect of reducing the heat actually absorbed by the cask to 5,000 BTU/hr-ft². This reduction was assumed when the melting times were calculated. However, newer casks no longer use water jackets, and the thermal insulation device assumed in the Modal Study is no longer present. Therefore, the heat transfer rate absorbed by the cask is expected to be much closer to the thermal output from the fire itself, since it cannot be assumed without testing that the polypropylene shield will behave like a water jacket. Since the time to reach lead melt is proportional to the rate of thermal input, the absence of the dead air insulator would have the effect of reducing the time required to melt the lead shielding from 1.09 hours to about 20 minutes. (Audin, 18) For the uranium and/or stainless steel shield, this means quicker increases in temperature than those postulated by the Modal Study, resulting in a reduction in the fire severity needed to cause a given accident condition.

1.3. "Lead cask bias" used to select most appropriate measurement parameter

The decision to use strain on the inner cask wall as the primary measure of cask response is based on lead's tendency to "slump" when subjected to high loading, resulting in high strains on inner cask wall. However, uranium and/or stainless steel are strong and rigid and thus will not slump. Rather, the force from impacts will be transferred to the joints and welds of the cask, likely resulting in a greater force being applied to them than those in a lead cask. The choice of strain as the sole measurement parameter for physical duress

will likely lead to an underestimation of the damage caused to newer casks through rupture of welds and seals in the event of an accident. Therefore, new experiments must be performed to model this behavior.

1.4. Incorrect use of "distribution" and "frequency" of velocities

The EIS states that, even though the average speed limit on national interstates has increased since the Modal Study, the distribution of accidents, and the frequency distribution of accidents, on the highways is not likely to change (EIS, J-66). However, there is no evidence cited to support this statement. The National Highway Safety Traffic Administration (NHTSA 1998), along with numerous other agencies, have provided evidence that increases in speed limit lead to more accidents, more fatalities, and a greater proportion of vehicles traveling at higher speeds. All of these suggest that the DOE is incorrect in claiming that increased speed limits will not affect accident severity distributions.

In one study assessing the change in Interstate fatalities in states which raised the speed limit in 1995, the NHSTA discovered that "Interstate fatalities experienced a statistically significant increase in those states that raised their posted speed limits late in 1995 or early in 1996." (NHTSA 1998) Further, the Insurance Institute for Highway Safety reported that distributions of travel velocities do indeed change with increased speed limits, stating that "in general, higher speed limits lead to greater proportions of cars travelling at very high speeds." (Institute) For example, the Institute cited traffic statistics in New Mexico, finding that "the proportion of motorists exceeding 70mph grew from 5 percent shortly after speed limits were raised [from 55 to 65 mph] to 36 percent." (Institute)

These studies seem to contradict the statement made in the EIS. Unless the DOE can obtain credible evidence to back its assertion that changing the speed limit will not affect the distribution of velocities or accident severities, it must be assumed that the NHSTA and the Insurance Institute are correct in concluding that increased speed limits do lead to higher proportions of persons traveling at high speeds. This means that the Modal Study's accident distribution is an underestimate of the true probabilities of severe accidents. This again is evidence that a new study must be performed. To accompany a new Modal Study, the NRC should also conduct an updated EIS on spent fuel transportation which accounts for modern speed, traffic, and accident conditions.

1.5. Improper assumptions regarding the location of severe accidents

The Modal Study findings are used to estimate the amount of radioactive material released as a function of accident severity, using strain on the inner cask wall and mid-lead temperature as the two variables to estimate this release. Also used is the Modal Study finding that in 99.4% of all rail and truck cask accidents, no cask contents would be released.

For the prediction of where along routes accidents may occur, the RADTRAN4 computer program was used. This method assumes that accidents could occur at any location along routes, with their frequency of occurrence being determined by the accident rate characteristic of the states through which the route passes and the number of shipments that travel the route. Important to note is that *state-specific*, and not city- or county-specific, accident rates were used. Thus, the "urban" accident rate is an average of the rates of all defined urban areas in a given state. In determining maximum effects of accidents, the methodology used was as follows:

The analysis assumed maximum reasonably foreseeable accident scenarios could occur anywhere, either in rural or urbanized areas. The probability of such an accident would depend on the amount of exposure to the transportation accident environment. In this case, exposure would be the product of cumulative shipment distance and the applicable accident rates. (J-61)

It appears that what was done was take the probabilities of *any* accident, which were state-specific for each population group, and multiply by a generic probability of a given accident being of a certain severity. That is, it is assumed that accident severity is randomly distributed between population zones. Using this assumption, it is concluded that "because of the large differences in the distances traveled in the two types of population areas, a severe accident scenario that might be reasonably foreseeable in a rural area might not be reasonably foreseeable in an urban area." (J-61)

However, it seems questionable that severe accidents are randomly distributed. Resnikoff analyzed 38 "extra severe" accidents to determine their location. Analysis of the rail accidents included in these 38 accidents showed that most high-speed impacts occur at downgrades, particularly if curves are present. Downgrades are as likely to occur in suburban as rural areas. In addition, the commission only based its estimation of "severe" accidents on impacts, not on fires or fire duration. Most of the truck accidents analyzed occurred in urban areas. Thus, the frequency distributions used by the EIS seem incorrect.

1.6. Improper Exclusion of most severe accident scenarios

1.6.1. The Modal Study used as its "average highway conditions" a stretch of Interstate 5 in Los Angeles and Orange counties. For example, it tallied the number, height, and geographic conditions of the bridges on this stretch and used these to estimate the number of bridges of a certain height. This was then used to estimate how many tall bridges existed in the entire nation for spent fuel trucks to cross. Using this, it was determined that an accident involving a truck falling off a high bridge was not "reasonably foreseeable" and its consequences were not determined. Since this stretch of highway is dominated by urban areas, the distribution of bridge types is biased in favor of small, short bridges, like the ones that cross over other roads. This is not representative of national conditions and leads to the unnecessary exclusion of a potentially disastrous consequence. After searching the FHWA and the DOT web sites for information regarding the frequency and heights of bridges, it seems that there exists no national database tracking bridge heights, although a national

inventory of bridge frequencies does exist. The number of bridges per mile of highway assumed in the Modal Study does seem to be reasonably representative of national tendencies after reviewing information on the National Bridge Information database. However, the bridge heights assumed are likely to be underrepresentations of national highway statistics.

As a minimum, the EIS on Yucca Mountain should report on the likely consequences involving a train or truck carrying spent nuclear fuel falling off a tall bridge. This estimation should include cleanup costs associated with any decontamination of water supplies which might be needed in the event of a fall into a water body. Unless a national database is available which provides information on the distribution of bridge heights across the country, the possibility of a fall off a tall bridge cannot be ignored, and the consequences must be assessed.

- 1.6.2. The Modal Study assumes that the probability of train accidents involving the falling off of a bridge is the same as that for the highway scenario, with the geographic conditions also taken from the highway estimations. More clearly, the Study used data taken from Interstate 5 to estimate the geographic conditions of national train routes, including bridge heights. Thus, the same argument given for the highway scenario (point 1.6.1) holds here, but more so since there is no proof that highway and rail conditions are similar.
- 1.6.3. The method of rejecting accidents having a yearly probability less than one in 10 million is arbitrary and incorrect when performing a probabilistic risk assessment. The product of the probability and the likely consequences are what determine significance in a risk assessment.
- 1.6.4. DOE consistently offers estimations of health effects due to transportation without giving a range of likely effects in the event of an accident. This is based on the assumption that the effects given are "conservative." However, the points raised here show that the studies are not conservative: unless new studies are performed, a range of possible health effects should be given.
- 1.6.5. If the DOE insist on using the "reasonably foreseeable" criteria of 1 in 10 million mentioned above, improper accident distribution data, unknown cask response to accident conditions, and improper estimation of accident probabilities (all mentioned above) will make some circumstances not deemed "reasonably foreseeable" in the Modal Study "reasonably foreseeable." These events must be considered in any acceptable consequence analysis.

Some final notes on the Modal Study, and on the Modal Study II

It is interesting to note that, in a review of the Modal Study (Plooster et al, 1986) conducted for the NRC, the analysts remarked that:

"Some current literature suggests that lead casks are on their way out. If this is so, then most of the work in this report will be obsolete when the next generation of shipping casks hits the rail/road." (b.1)

Similarly, the Modal Study itself comments on the usefulness of the results if new cask designs are implemented or transportation conditions change:

"New designs using alternative design principles and materials, or changes to regulations such as the imposition of a 75 mph national speed limit, could affect the results and conclusions of this study."(xx)

So, we are merely agreeing with the Modal Study and its review in stating that the current study is obsolete and that a new study needs to be performed before any of its conclusions can be used. Recently, the NRC and Sandia National Laboratory have begun the process of developing an updated Modal Study to address many of the objections raised above. Public hearings on this plan are set to begin on November 17th in Bethesda, Maryland. It would be proper for DOE to use the updated Modal Study as part of a larger EIS on spent fuel transportation. Additionally, the updated Modal Study public hearings should be used as a venue to address the need for a new transportation impact analysis concerning Yucca Mountain as the destination for the nation's spent nuclear fuel and high-level radioactive waste.

15 cont.

2. Deficient Treatment of Sabotage

There are a number of points of contention with the current treatment of sabotage by the DOE in the Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (DOE/EIS-0250D, 1999) and referenced documents. In order to establish the need for a reevaluation of the analysis of sabotage used by DOE in preparation of the EIS most clearly, only the most significant problems will be addressed. The final conclusion of this section is that the DOE does not adequately address the threat of sabotage, nor does it prove that concerns about the affects of such an event are unwarranted.

2.1. Inadequate selection of Reference Weapons and Reference Cask

The type of shaped charge used in the Sandoval experiments and cited in Luna as the device offering the maximum impact of a sabotage attack is the M3A1 military shaped charge. This charge, when tested against a full-scale GE IF-200 cask, was capable of penetrating one cask wall, penetrating 42 cm (16.5 inches) into the cask, damaging 50% of the spent fuel rods, and releasing more than 1% of the total fuel. Sandoval also says that a survey of attack devices was performed in this study, with the devices selected based on their availability to the perpetrator and their potential to breach truck casks. The details of this evaluation are classified.

In order to better understand exactly what devices were considered for possible use as the reference weapon, it is necessary to understand the restrictions placed on this analysis. In 10 CFR 73.1.a.1, "radiological sabotage" is defined as:

15 cont.

- (i): a determined violent external assault, attack by stealth, or deceptive actions, of several persons with the following attributes, assistance, and equipment:
 - a. well-trained (including military) and dedicated individuals
 - b. inside assistance, passive or active
 - suitable weapons, up to and including hand-held automatic weapons, equipped with silencers and having
 effective long-range accuracy
 - d. hand-carried equipment, including incapacitating agents and explosives for use as tools of entry or for otherwise destroying reactor, facility, transporter, or container integrity or features of the safeguard system
 - e. a four-wheel drive land vehicle used for transporting personnel and their hand-carried equipment to the proximity of vital areas
 - (ii): an internal threat of an insider, including an employee
 - (iii): a four-wheel drive land vehicle bomb

This provides the parameters by which the assessment of possible weapons was made. The definition of "hand-carried equipment" is unclear. It appears that such anti-tank artillery as the Milan Anti-Tank Missile and the US TOW 2 Anti-Tank missile, reported to have armor-penetrating capabilities of greater than 1000mm (39.4 inches) and greater than 700 mm (28.5 inches), respectively, have not been considered as plausible sabotage weapons. In contrast, the M3Al is reported as having armor-penetrating capabilities of at least 20 inches. This means that either of the anti-tank missiles will penetrate deeper into a spent fuel cask, likely completely through, drastically increasing the amount of material released. Anti-tank missiles of this sort must be analyzed in a credible sabotage analysis. Both devices can be transported by a few persons, or a vehicle, and thus should be considered "hand-carried."

Failure to consider arson coupled with missile strike as credible reference weapon and reference attack

A very significant factor to note when analyzing the results of the Luna report is that missile strikes accompanied by fires have not been considered. In section 3, the following statement is made:

"[U]nlike tanks and other typical targets of armor-piercing weapons, nuclear waste casks contain no explosive or combustible materials that could be touched off by the HEDD penetration, so little secondary damage is expected. In other words, only penetration and swept volume of spent fuel disrupted determine the magnitude of the damage that can be inflicted by an attack on a cask, not penetration depth per se."

This shows a hidden assumption in the assessment of sabotage. The Luna study assumes that there will be no fire coupled to a missile strike in the event of sabotage. Luna makes this assumption noting that the casks themselves are not combustible. However, this does not account for the potential of saboteurs to deliberately set a fire, or for the fact that the casks will be in proximity to combustible materials while being transported. Shipping casks are designed for transport on trucks or trains that are powered by highly flammable, combustible materials. These casks are also very likely to spend a significant portion of their travel in proximity to other trucks, rail cars, pipelines, etc. containing combustible or explosive materials. Further, potential saboteurs must be assumed to have knowledge that engulfing a target in flames in addition to striking it with a missile will be very likely to

15 cont.

cause extensive damage. All of these factors lead to the conclusion that "secondary damage" cannot be ignored, as it has in this study.

Heat input to a cask will weaken the areal density of the metal shielding layers. If potential saboteurs were to first weaken the shipping casks via thermal input before missile strike, this could significantly increase the damage caused by such an event. In a series of experiments testing resistance of shipping containers to puncture conducted for the NRC by Lawrence Livermore National Laboratory and published in 1980, the impact of increasing temperature on cask strength was addressed (NUREG/CR-0930). One experiment in this study concentrated on the effect of temperature on the ultimate "punch force" required to completely penetrate a shipping cask wall. From this test it was determined that "the force at failure decreases with increasing temperature," (NUREG/CR-0930, pg 32). This study used three temperatures for this determination: room temperature, 200°F, and 400°F. Since this study shows there is a correlation between the force required to penetrate a shipping cask wall and the temperature of the cask, it is very important that these effects be considered in a proper evaluation of sabotage scenarios. Further, the temperatures involved in deliberately set, engulfing fires will be able to raise the cask outer wall temperature to levels much beyond this range. In the Modal Study, it is commented that the rail and truck casks used in their analysis "can be exposed to a regulatory fire (1475°F, engulfing) for over 1 hour" (6-43) before the temperature at the mid-lead thickness of the cask wall reaches 500°F. The problems with the use of the Modal Study are detailed in section 1 of this report, and the use of the above statement in no way endorses the validity of the Modal Study's conclusions or methodologies. What this statement does show is an acknowledgement that the regulatory fire will raise the temperature of a shipping cask wall over the 400°F temperature estimate used in NUREG/CR-0930. This leads to the conclusion that in extreme fire situations, such as those deliberately set as part of a sabotage attempt, the temperature of the shipping cask will rise. This will lessen the force required to completely penetrate the shipping cask wall, as was discovered in NUREG/CR-0930, resulting in greater damage to a fuel cask in the event of a subsequent missile attack.

In addition, not addressing the effects of heat input on spent fuel respirable release in the event of a breach ignores the ability of temperature to increase the percentage of spent fuel released in respirable form. For example, the conversion of UO_2 to U_3O_8 is exothermic at slightly elevated temperatures, and results in the formation of a fine powder of respirable size (Aronson). Coupling a fire with a cask breach will expose the spent fuel inside the cask to elevated temperatures, resulting in thermodynamically favorable conditions for the above reaction. The importance of this term needs to be addressed in an assessment of sabotage consequences.

By failing to include thermal effects in its assessment of sabotage, the DOE has provided an insufficient treatment of sabotage consequences in the Yucca Mountain EIS. This needs to be remedied before the true impact of a successful event can be analyzed.

2.2. Improper extrapolation of previous experiments to current cask designs

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2.2.1. Swept Volume

In the Luna report, it is acknowledged that the cask design used in the 1980-1981 tests examined in the Sandoval report is outdated, and an attempt is made then to correlate the data collected in these experiments to a computer simulation of a newer-design cask impact by two HEDD devices. In particular, Luna suggests an "alternative" means of analyzing the test results in the Sandoval report which "enables evaluation of the magnitude of the potential source term in other situations based on calculated hole volumes." (Luna 2.2.6)

To do this, Luna attempts to correlate the experimentally determined ratio of respirable aerosol produced to the mass of fuel released in an event to a calculated ratio based on the mass of swept fuel. The equation is (Luna 2.2.6):

 $MS = (\pi/4) \times NP \times NL \times NR \times PL \times PD$

NP:

An estimate of the amount of fuel assumed to be affected longitudinally in the pin at the center of the hole. Assumed to be the number of pellets in the missing length rounded up to the next whole pellet. Operationally defined as L/L_p , the missing length of pin divided by the pellet length [unitless].

NI:

An estimate of the affected number of pins laterally.

Assumed to be the number of pins within the hole diameter rounded up to the next integer Operationally defined as L/PP, rounded to the next integer, giving it units of [length²]

NR:

Defined by Luna as "number of rows of pins along the disruption path/PP," thereby giving it units of [length].

PL

Depth of penetration of pin disruption.

Operationally defined by Luna as NR/PP, giving it units of [length²]

PD = pellet density, giving it units of [mass/length³]

Thus according to Luna, the equation works out to be:

 $MS[mass] = (\pi/4)[unitless] \times NP[unitless] \times NL[length^2] \times NR[length] \times PL[length^2] \times PD[mass/length^3],$

 $[mass] = [mass*length^2]$

The inconsistent units definitely need explanation by the Sandia researchers responsible for the report. The numerical values obtained using this equation were duplicated by independent calculations, assuming that the number of rows of pins along the disruption path was 6 for the full-scale test (see attached spreadsheet). This suggests that either the units are listed incorrectly in the document, or that the equation used to estimate swept mass is invalid. Until this discrepancy is addressed, the DOE's use of the Luna report in the Yucca Mountain EIS is suspect.

Even if the unit discrepancy is a mere typographical error, equating the mass of swept fuel with the respirable release fraction fails to consider such factors as number of holes of penetration (2 for full penetration) and differences in thermal properties of HEDD devices. First, it was assumed that, because the Sandoval full-scale test and the computer modeled test in Luna predicted shaped charges to penetrate only one side of a shipping container, the amount of released respirable material could be described as proportional to the "swept volume" of the fuel pins. However, it was also acknowledged that having multiple holes (for example, an exit and entry hole, or multiple entry holes caused by multiple device strikes) would significantly increase the fraction of respirable material released, since multiple holes will allow outside air to flow through the cask. Because the DOE assumes that a terrorist strike will result in only one hole into a shipping container, it is assumed that this air flow will not be generated, thus leading to the correlation between affected mass and respirable release.

However, it is necessary to consider the event of a full cask penetration (or multiple-hole penetration) event. Under these circumstances, there will be a continual supply of oxygen provided to the inner core of the cask. This oxygen will then react with the uranium dioxide spent fuel, oxidizing it to U_3O_8 . This process is exothermic at slightly elevated temperatures, and results in the formation of a fine powder of respirable size. Further, this air flow, when coupled with elevated temperatures resulting from fire (as would be reasonable in the event of a crash or deliberate arson) would heat the core of the cask without having to first heat its surrounding shields. This will result in a quick elevation of the spent fuel temperature, providing more oxidation and thus more respirable aerosol production. Because the DOE assumed that all sabotage events would at most penetrate a shipping cask with one hole, this mechanism was ignored.

In review of the testing performed at Sandia and Batelle laboratories in the 1980s, it is stated that the M3A1 charge used would completely penetrate certain shipping casks such as the NFS-4 (Dietrich & Walters, 1983 pg. 5). If this type of cask were used in destructive testing, the benchmark forming the basis for the Luna results could be drastically different. This shows the need to consider the effects of a complete penetration event. In the case of a complete penetration, according to the review cited above, "the entrainment of particles in the jet's wake would enhance release at the jet exit hole. Further, two holes should vent more rapidly than one and perhaps capture higher initial concentrations in the efflux" (5). By referencing a flawed computer evaluation of cask resistance to HEDD impact, the EIS has improperly limited the discussion of impacts associated with sabotage events to single-hole, incomplete penetrations. This results in an incomplete estimate of the true effects of a successful sabotage event.

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The Luna report acknowledges that the existence of multiple holes results in significant increases in aerosol release fractions. In section 2.2.5, the report states that "the total effect of a full penetration event may be to increase aerosol release by approximately 10 times the aerosol release fraction from partial penetration." If we use this factor of 10 to figure out a new % respirable release and account for the difference between spent fuel and surrogate fuel, the % respirable release is greater than 1%. Below is outlined the % respirable release fractions assuming 10X greater release than was estimated in the Sandoval tests. Also, three different spent fuel-surrogate fuel correction factors are used (see section 2.2.3) to show how they affect the results.

| | | Release fraction from Sandoval tests | New release fraction, assuming 10x Sandoval result |
|---|---|--------------------------------------|---|
| | Aerosolized fraction of surrogate fuel mass released from pins | 0.000537 | |
| | % aerosolized fraction of spent fuel mass released from pins, using SFR of 3 | 0.1611% | 1.611% |
| - | % aerosolized fraction of spent fuel mass released from pins, using SFR of 5.6 | 0.300% | 3.00% |
| | % aerosolized fraction of spent fuel mass released from pins, using SFR of 12 | 0.644% | 6.44% |

More analysis needs to be performed before a swept fuel mass can be used as a correlation factor predicting masses of respirable fuel released in the event of a high-energy impact.

In using Swept Volume as a surrogate for respirable release, the analysis is making the assumption that all potential devices used in a terrorist attack will behave the same as the M3A1 charge. Its conclusion rests on the assumption that, given a certain swept volume size, a certain respirable mass fraction will be released, regardless of other factors, such as differences in thermal heat evolution. Further, the computer code used to estimate release fractions of other casks was calibrated using only two test results. When it was found that the code underestimated the hole size by a factor of two, the calibration simply multiplied by 2 to obtain a correlation. Without an experimental validation of the ability of the SCAP code to effectively model the newer-generation casks, this approach is unacceptable.

2.2.2. Respirable Aerosol Production

Luna addressed a mechanism for additional respirable aerosol release due to the pressurized nature of actual spent fuel rods which was not addressed by the Sandoval tests using unpressurized rods. The report states that in the Sandoval experiments there was a "significant amount of surrogate fuel aerosol created within the cask by the HEDD that remained inside and was ultimately deposited on the inner surfaces of the cask." Some or all of the unaccounted material in the Sandoval tests (which

Sandoval concluded "could not have been respirable") is likely to be made up of this material. Luna states that, given a mechanism to create flow of gas out of the cask, this could become an additional respirable aerosol source.

The Luna study addresses the fact that real fuel rods are pressurized, and that rupture of these rods allows gas to escape, producing a flow that will carry aerosol into the environment. In every test subjecting shipping casks (real or modeled) to a HEDD explosion, the fuel rods used were not pressurized, and there was never a direct measurement of the actual quantity of respirable aerosol within the cask that would comprise this contribution from "blowdown." Luna then attempts to estimate the amount of respirable material generated via this pathway by using a brittle fracture study conducted at Argonne National Laboratory (Jardine et al, 1982. "Final Report of Experimental Laboratory-Scale Brittle Fracture Studies of Glasses and Ceramics," Report No. ANL-82-39, Argonne National Laboratory, Argonne, IL.)

Jardine developed experimental data on the amount and size distribution of particulate material produced by calibrated hammer impacts on brittle materials. His work developed a linear relationship between energy density in the material from the impact of a calibrated hammer on brittle materials and the mass of particulate material with geometric diameter less than 10µm over 2 orders of magnitude in energy. Important to note is that Jardine used materials that were sufficiently refractory to ensure that melting and vaporization were not a factor. Thus, one problem with correlating this study for use in tests involving high density devices is that thermal properties are not considered. This is incorrect for missile penetrations, especially when they are coupled with fire (deliberate or otherwise).

Next, Luna takes the relationship found by Jardine for particles of $10\mu m$ geometric size and says that this analysis is not interested in these particles. Luna states that "of interest to this study is the quantity of particles that are of respirable sizes. For uranium dioxide pellets with a density of $10.5~g/cm^3$, this corresponds to a geometric size of about $3\mu m$." The use of $3\mu m$ particle size is unsubstantiated, since particles of size $10\mu m$ are airborne and will contribute to overall dose in the event of an explosion. Further, $10\mu m$ particles are generally considered the maximum size for respirable aerosols. Therefore, this is the size that should be used in determining the aerosol fraction released in sabotage tests.

Particles of size in the range of $10~\mu m$ are small enough to be dispersed quite far from an implosion scene. In addition, they can be deposited in the nasal region of the respiratory tract. While it is rare that particles of this size penetrate into the lungs, they will contribute to overall radiological dose. In addition, many of the particles deposited in the nasal region will be ingested, contributing to continued dose inside of the body. Ignoring particles greater than $3\mu m$ thus leads to an underestimate of the true radiological health effects of a postulated terrorist event.

To estimate the impact energies expected from HEDD1, Luna takes the estimated HEDD1 kinetic energy and divides it by the estimated swept volume of the disrupted fuel. Luna then makes two estimates: "the highest energy represents no attenuation of the HEDD energy by penetrating the wall. Since the HEDD action penetrated about equal amounts of mass per unit area passing through the wall and passing through the fuel, the residual energy deposited in the fuel is likely to be one-half to one-third of the initial energy density. This is shown by the low end of the range indicated on the plot." In fact, the lower energy is 1/3 of the higher energy. Luna then states that the correlation, using a particle diameter of 3µm and an energy density of 1/3 the estimated initial energy density, approximates that 5% of the unaccounted mass will be respirable.

There are a number of things seriously wrong with this conclusion. First, the Jardine study that the entire relationship is based on does not take into account thermal effects when estimating the correlation between energy density and respirable aerosol production. The correlation used was obtained from a test involving a calibrated hammer, not a high-temperature explosive device. As was mentioned earlier, Luna comments that "all materials were sufficiently refractory to assure that melting and vaporization were not a factor in the tests." (22) This suggests that the correlation is leaving out the importance of temperature in creating additional respirable particles, which if included would certainly increase the fraction of respirable aerosol production.

Second, the UO₂ and spent fuel data points obtained from other studies (MacDougall et al, 1987. "Site Characterization Plan Conceptual Design Report, Volume 4, Appendices F-O," Report No. SAND94-2641, Sandia National Laboratories, Albuquerque, New Mexico), (Alvarez et al, 1982. "Waste Forms Response Project Correlation Testing," Report No. EGG-PR-5590, Idaho National Engineering Laboratory, Idaho Falls, Idaho), which Luna states act to validate the use of the Jardine results for spent fuel, are inconclusive. The data from the MacDougall study is in the very low energy density range, and they cannot be used to demonstrate any correlation without more data points taken in the higher energy density range. The Alvarez study appears (the graph in Luna is hard to read) to provide respirable percents from 2%-40% at an energy density approximately 7 times smaller than the density estimated for the HEDD. Regardless of any of these uncertainties, the Luna study assumes one value for the respirable fraction produced and places no uncertainty boundaries on it.

Third, Luna assumes that the HEDD will have an energy density of 1/3 that estimated based on the swept volume and kinetic energy of the device. It is argued in the Luna study that since the device penetrated about equal amounts of mass per unit area penetrating the wall of the cask as it did penetrating the fuel rods, the energy available for action on the fuel rods is likely "to be ½ to 1/3 of the initial energy density." However, this assumes that the HEDD action on the cask wall does not

impart an energy to the fuel rods. Because of this fact, Luna's use of 1/3 of the initial assumed energy density is an underestimate (using 1/3 instead of ½ is an underestimate in itself). Without actual knowledge of the amount of respirable aerosol produced (as in a properly sampled test), the energy density should be assumed to be 100% of the initial.

In order to check the effect of the assumptions made by Luna in correlating the Jardine data to the sabotage benchmark, we calculated the likely aerosol release ignoring all of the objections raised here except for the use of 3 µm particles (see attached spreadsheet). Instead, we used Figure 2 from the Luna report to obtain a % respirable production in the energy range given by Luna for the HEDD penetration assuming 10µm-sized particles. Using this, the Jardine correlation estimates that 50-100% of the fuel impacted by the HEDD will be respirable, as opposed to the 5% assumed by Luna. This changes the respirable surrogate fuel aerosol produced estimate from .19kg (Luna) to 1.91-3.82 kg.

Without any direct measurement of the respirable aerosol produced by HEDD penetration, the 5% assumption used is neither conservative nor grounded in reality. Unless experimental studies are conducted that specifically measure this term, a more conservative approximation of 50-100% respirable production must be used.

2.2.3. Spent Fuel to Surrogate Fuel Aerosol Ratio

The Luna report also proposes a reduction in the spent fuel to surrogate fuel aerosol ratio used to estimate spent fuel releases using data obtained with DUO₂. Luna lists several experimental estimates of the (spent fuel release/ surrogate fuel release) which vary over two orders of magnitude: .53, 5.6, .71, .42, 3, 2.8, 2.5, 3, 12. The Sandoval report used the value of 5.6, obtained for the analysis using a wet sieve technique. However, Luna questioned the validity of this technique, and concluded that a value of 3 was a more valid ratio, largely based on the only spent fuel aerosol point obtained from any experiments. Again, it is difficult to see how this can be substantiated. For the most conservative approach, the ratio should be the highest one experimentally estimated, which is 12.

In order to determine the effect of using different ratios on the estimation of the source term for a spent fuel release, we recalculated the estimated amount and percentage of fuel released from the truck cask used in the Sandoval experiments in the manner done by Luna in table A-1. We calculated this term while varying this ratio from 3 to 12, in addition to varying the estimated respirable aerosol production from 5% - 100%. The results are summarized below.

| Respirable aerosol production percentage | Spent fuel correction | -sun ogate fuel - Respir factor - produc | | Percentage of total spent fuel in cask | |
|---|-----------------------|---|-------|---|---|
| | 5 | 3 | 0.574 | 0.29% | ┫ |

| 50 | 3 | 1.071 | 0.53% |
|-----|-----|--------|--------|
| 100 | 3 | 2,294 | 1.14% |
| 5 | 5.6 | 5.736 | 2.85% |
| 50 | 5.6 | 10.708 | 5.33% |
| 100 | 5.6 | 22.945 | 11.41% |
| 5 | 12 | 11.472 | 5.71% |
| 50 | 12 | 21.415 | 10.65% |
| 100 | 12 | 45.890 | 22.82% |

Luna's result

Clearly, the 0.29% release calculated by Luna is not conservative. This is important because the same assumptions about spent fuel-surrogate fuel ratios and respirable aerosol productions are used when estimating the effects of HEDD impact on newergeneration casks. As is shown above, these assumptions are incorrect and lead to highly incorrect results. Because of this, it is recommended that experimental tests be performed subjecting new generation shipping casks to HEDD impact, rather than to rely on an incorrect computer simulation.

2.3. SCAP computer code used without sufficient benchmarking

The Luna study attempts to utilize a computer model as a replacement for actual experimentation in order to determine the possible damage caused by two HEDD's on state-of-the-art shipping casks. However, the code that they use admittedly does not model multi-layered targets well. The Luna study "benchmarks" the SCAP code against the Sandoval full-scale test and determines that the code predicts penetration depth well, but underestimates the size of the hole created by the penetration. In an attempt to remedy this, the Luna report multiplies the predicted hole size by a factor of 2.0 to obtain "correct" results, then proceeds to do the same when modeling other cask designs. This approach is seriously incorrect. It assumes that the code will consistently model all cask layer or shell arrangements, including different numbers of layers, which is incorrect. Important to this analysis is understanding the reasons why the SCAP code underpredicts the hole diameter. According to Luna, "underestimation is believed to be a result of some secondary effects, such as the dispersive layered nature of the targets, the relatively unfocused nature of the HEDD1, and the near one-dimensional nature of the flow dynamic of the code." (23) The SCAP user's manual addresses the problems in applying the model to predict penetration characteristics on multi-layered targets, stating that "there may exist interface phenomena not modeled by the code which could result in serious difficulties in comparing SCAP modeling output and experimental data. For a limited number of interfaces the code should still be useful." (27, emphasis added).

Below is a table comparing the cask used in the Sandoval study with the casks used in the Luna model.

| Cask used in Sandoval: | | Truck Cask used in Luna | | Rail Cask used in Luna | |
|-----------------------------|----|-------------------------|----|--------------------------|-----|
| Steel-lead-steel truck cask | | steel-uranium-steel | | steel-uranium-lead-steel | |
| Weight (ton) | 25 | weight (ton) | 25 | weight (ton) | 125 |

| | | Neutron shield: polypropylene layer (cm) | 11.43 | neutron shield: steel outer layer (cm) neutron shield: water jacket layer (cm) | |
|---|--------|---|--------|---|---------|
| Neutron shield: water jacket, empty (cm) | 11.43 | | | 1 | 0.635 |
| | 11.43 | Neutron shield: steel outer layer (cm) | | . | 3.81 |
| Steel inner shell thickness (cm) | 0.79 | Steel inner shell thickness (cm) | 0.9525 | uranium middie thickness (cm) | 5.55625 |
| Lead middle thickness (cm) | 16.84 | Uranium middle thickness (cm) | 7 | lead middle thickness (cm) | 1.27 |
| Steel outer shell thickness (cm) | 3.175 | Steel outer shell thickness (cm) | 3.81 | steel outer shell thickness (cm) | 4.60375 |
| Length (cm) | 490.22 | Length (cm) | 406 | length (cm) | |
| Inner cavity diameter (cm) | 69.85 | Inner cavity diameter (cm) | | inner cavity diameter (cm) | 162.56 |

Looking at the above table, it becomes apparent how different the three casks actually are from each other. They consist of different materials in different proportions, can carry different numbers of fuel assemblies, and have different sizes and weights. Regardless of these factors, the analysis carried out in the Luna report assumes that the correction of "2.0" to the predicted hole diameter is appropriate for all of the casks above.

As is shown on Table 1 of the Luna report (pg 34), the casks are broken down into different layers to be used as input into the SCAP code. What is important to note is that with every different layer, there exists an interface which is not modeled by the SCAP code. For the cask used in "benchmarking" the code, these interfaces were air-steel, steellead, and steel-PWR assembly, along with the various interactions in the assembly itself. A factor of 2 difference between the predicted hole size and the larger experimental hole was attributed to difficulties in modeling these interface phenomena, among other things. This factor of 2 was then assumed to account for the interface phenomena in the other casks listed above, even though these casks have different interfaces and different numbers of layers. There is no justification of this step.

The use of the SCAP code to model cask response to shaped charge attack without having an appropriate experimental model to calibrate with is unacceptable. The SCAP code consistently underpredicts the diameter of the hole created by the explosion of the M3A1 device against the outdated cask used in the Sandoval report. The only justification that has been given for using a factor of two to correct this underprediction is that this makes the code correlate with experimental results. Therefore, it seems necessary to conduct new experiments using the newer casks to determine how to correlate the SCAP code with these experimental results. Since the newer casks have different numbers and types of layers, and since new HEDD devices are modeled by the code, it is likely that the deviations from experiment will be significantly different from those in the Sandoval case. Therefore, the Sandoval test results must not be used to calibrate the SCAP code for new casks and HEDD's.

Further, it appears that the PWR assemblies were modeled as having a single, uniform density which was taken as an average of the densities of the fuel rods, the uranium, and air. This leads to the false assumption that the penetration of the HEDD will be

consistently impeded by dense material, rather than using the reality that the HEDD will find a very mixed environment with respect to density inside the cask cores.

In summary, the SCAP code simply cannot be used to provide a reliable or conservative estimate of the amount of damage expected to be caused by a HEDD on a multi-layered, modern cask. Unless there is experimental evidence that confirms the estimations presented in the Luna report, they should not be used as credible indicators of the effects of a successful sabotage event. The admitted shortcomings of the SCAP code-namely that it does not accurately predict penetration phenomena into multi-layered targets- prevents this code from offering useful information, especially since there have been no actual experiments to back these predictions up. It is not sufficient to benchmark the code against experiments performed on an outdated cask having fewer and different layers. Actual experiments must be performed with potential HEDD's in order to assess the validity of the SCAP predictions. Until this is done, the results remain irrelevant.

2.4. Omission of important sabotage scenarios

2.4.1. Intermodal transfer station sabotage event

The EIS, on pg. J-95, states that section J.1.5 evaluates the effects of sabotage on intermodal transfer stations. However, there is no section J.1.5, and there is no mention of this potential sabotage event again. It is essential to perform an analysis of the likely effects of a successful sabotage event on an intermodal transfer station because of its unique conditions. For one, shipping casks at an intermodal station will be stationary. This eliminates some of the problems associated with striking a moving target optimally that were presented in the EIS. Also, this makes the possibility of a multiple-cask release possible. Third, the appeal among potential saboteurs of attacking a station rather than a truck or train must be addressed. Intermodal transfer will also occur at reactor sites without rail access. All of these factors suggest that the potential for sabotage at an intermodal station must be addressed in a comprehensive manner.

2.4.2 Barge transport sabotage event

The EIS does not consider the consequences of a possible sabotage event on a barge shipment of spent nuclear fuel. As this is one of the transportation options being considered, it is important to consider the effects of a successful sabotage event, including the breach of shipping casks and release of radioactive material into the air and water, especially near populated areas, water supplies, or natural environments. It is essential to address this concern, especially since there was no discussion of the consequences of severe barge accidents, which were determined by the EIS to be not reasonably foreseeable.

2.5. Failure to identify/profile potential "Threat Groups"

It would be helpful to provide some general profiles of potential "Threat Groups" in terms of characterizing exactly what these groups are capable of doing, and the relative likelihood of each group performing a sabotage act. This would help in determining what types of weapons, forces, expertise, etc can be expected to be utilized by different groups, providing the DOE with a better estimate of what safeguards must be put in place. The Final Environmental Impact Statement: U.S. Spent Fuel Policy, Storage of Foreign Spent Power Reactor Fuel (1980: DOE/EIS-0015) provides a list of "Threat Groups" to nuclear fuel storage and transportation; a similar, but updated, list would be helpful.

2.6. Improper dismissal of considering the probability of terrorist events

The EIS and the Luna report both consistently state that, since sabotage events are not randomly occurring, no estimation of their probability can be made, other than assuming they are "extremely rare." However, some comment should be made concerning the increase in large-scale terrorist attacks and how this relates to the need for sufficient safeguards against such attacks. Even though attacks are not random events, some effort should be made to identify trends, such as the increase in attacks on American soil over the last few years. This provides a proper foundation through which to analyze the level of protection required from terrorist attacks.

2.7. Failure to present a true "worst case scenario" for consequence analysis

2.7.1. Use of "averaged" wind conditions instead of wind blowing in one direction

The inputs used by the DOE in determining health effects of a successful sabotage scenario assume generalized wind conditions. For a true worst-case scenario, the impact of a radiological release directly downwind from a large population center, such as an office building, prison, stadium, etc. must be addressed. The use of wind conditions averaged over all directions dilutes the effect of a single-direction wind event.

2.7.2. Use of "average" (neutral) weather conditions, instead of worst-case conditions

The EIS states that, because the time and place of a sabotage event cannot be predicted, average weather conditions for the entire United States must be used. However, it seems likely that potential saboteurs will, to the degree feasible, plan sabotage events around those weather conditions that are the most damaging. Thus, for a true "worst case" sabotage scenario, weather conditions leading to the greatest consequences should be used.

2.7.3. "One bullet assumption"

As has been previously discussed, the consideration of only a single HEDD strike in the simulation of a sabotage event is unrealistic. Terrorists who are serious about causing a significant release of radioactive material, and who have the means of obtaining armor-penetrating weaponry, will likely bring a complete arsenal, including several armor-penetrating devices, incendiary devices, etc. Therefore, cask response to multiple missile penetrations, especially if they are fired in succession such that missiles strike an already damaged cask, must be addressed. It is extremely likely that the damage done to an already-penetrated cask will be substantial. This has not been assessed by the DOE and must be in order for the sabotage portion of the EIS to be considered complete.

2.8. Failure to assess social, psychological, environmental, or economic costs

In order to be able to assess the consequences of a successful sabotage event satisfactorily, the full scale of effects must be studied. The DOE has commissioned studies addressing the psychological impacts of radiation accidents on the public, but similar studies have not been performed for this EIS. In addition, no consideration of the cost of cleanup of such an event is given. Below is a skeleton outline of the various factors not considered by the EIS that need considerable attention.

- 2.8.1. Social/psychological costs not addressed
 - 2.8.1.1. Increased fear of nuclear energy, and nuclear industry
 - 2.8.1.2. Fear of vulnerability to attack (see Oklahoma City bombing)
 - 2.8.1.3. Susceptibility of foreign-born citizens to discrimination
 - 2.8.1.4. Distrust of government that transports materials capable of such destruction
- 2.8.2. Environmental costs not addressed
 - 2.8.2.1. Groundwater and/or surface water contamination→ more human costs
 - 2.8.2.2. Loss of land use near site for significant amount of time
- 2.8.3. Economic costs not addressed
 - 2.8.3.1. Cleanup costs
 - 2.8.3.2. Decontamination costs
 - 2.8.3.3. Lost workdays due to radioactive contamination of roads, buildings, etc
 - 2.8.3.4. Loss of tourism in Las Vegas, eg, due to contamination or fear
 - 2.8.3.5. Evacuation costs
 - 2.8.3.6. Relocation costs

3. Inputs to computer models predicting exposure levels

DOE relies on the validation of the RADTRAN, RISKIND, INTERLINE, AND HIGHWAY programs performed by Maheras and Pippen (DOE/ID-10511, 1995). In order to validate the RADTRAN4 and RISKIND computer codes, Maheras and Pippen compare the results of the code to the results of hand-calculations. However, the hand calculations use the same equations and assumptions as the computer code. This is not a validation of the code at all. A true validation would involve benchmarking the code against actual events. Since this is not possible, a

validation should involve analyzing the assumptions inherent in the program and not just reproducing the results of the equations used.

3.1. Use of temperature and strain as independent variables

Refer to Resnikoff, 1993. In many severe accidents, high impacts are coupled with vehicle fires. In predicting probabilities of accidents of a given severity, the probability of fire of a certain severity is multiplied by the probability of an impact of a given strain. This tends to underestimate the "true probability" of strain-fire accidents, as these two variables are not independent. This is another artifact of the Modal study needing revision.

3.2. Inconsistent assumptions made in RADTRAN4 and RISKIND

- 3.2.1. DOE employs RADTRAN4 for total risk, summing individual accident probabilities multiplied by consequences. RISKIND is employed to assess the maximum accident consequences. The assumptions employed should be identical, but they are not. RADTRAN4 assumes ingestion of contaminated food after an accident in rural areas in determining collective population dose; RISKIND assumes no radiological dose to populations from ingestion of contaminated food after an accident in determining maximum accident scenarios. It is unclear why these two inputs are different.
- 3.2.2. In calculating effects to the maximally exposed individual in an accident scenario, the EIS assumes that this person is located 360 meters (~1200 ft) from the site. In calculating effects to the maximally exposed individual in a sabotage scenario, the EIS assumes this person is 140 meters (~460 ft) from the site. It is unclear where these distances came from, or why they are different.

3.3. Incident-free exposure assumptions

3.3.1. Escorts

DOE based its estimates of annual dose to escorts on regulations that we believe are insufficient to ensure the safety of the transportation vehicles. We recommend that these requirements be increased so that there is always at least one armed escort traveling in a separate vehicle from all truck shipments, and in separate rail cars for all train shipments. This will increase the estimated dose to escorts.

3.3.2. Individuals stuck in traffic

DOE assumes that individuals exposed to radiation dose due to being stuck in traffic near a transportation vehicle will occur only once per individual. However, personal driving patterns are not random, since people (especially commuters) tend to be on

the same road at the same time of day. Therefore, persons being stuck in traffic near a transportation vehicle once are likely to be stuck multiple times.

In addition, the EIS assumes that a traffic gridlock incident will last one hour. This is contradicted by a report by Darrough. In a presentation before the US Nuclear Waste Technical Review Board, Transportation and Systems panel, the average gridlock time is taken as up to 4 hours, resulting in much higher doses for individuals stuck in transportation.

The EIS needs to consider multiple-event, 4-hour duration traffic gridlock incidents in estimating the dose received by this exposure group.

3.4. Population density

The EIS uses average population densities from the 1990 Census to estimate the "worst-case" accident and sabotage scenarios. This ignores time-dependence, such as daytime population densities in cities due to worker commuting (Manhattan's population doubles every day), tourist population densities, special-event and localized densities. The maximum population densities used in the RISKIND code should reflect these factors.

3.5. Characteristics of spent fuel used in accident consequence estimates

3.5.1. Age of spent fuel

Simply put, the longer a given type of fuel is removed from a reactor prior to shipment, the less radioactive it is. Fuel which has cooled for a long time has had the time to undergo decay reactions, reducing its level of radioactivity.

In the Yucca Mountain EIS, DOE assumes different spent fuel ages for different analyses. For the analysis of impacts to workers during loading operations, at commercial sites, DOE used analyses documented in previous reports (Smith, Daling & Faletti 1992), (Schneider 1987) using 10 year-old PWR fuel with a burnup of 35,000 MWd/MT. For transportation accident scenarios, DOE uses PWR fuel aged 25.8 years.

The DOE assumes in its estimates a spent fuel age of 25.8 years, even though fuel is only required to be cooled for 5 years prior to transportation. This results in a reduced estimate of hazard. Unless the DOE can show through legal requirements that spent fuel will be aged 25.8 years prior to shipment, it is not appropriate to use this age in its exposure assessments for incident-free and accident scenarios.

A more likely scenario is that older fuel, already stored in storage casks at reactor sites or at the proposed PFS storage facility in Utah, will remain stored while newer fuel, stored in fuel pools, but aged more than five years, will first be transported off

the reactor site so that reactors can be decommissioned more rapidly. Currently, the proposed PFS facility in Utah is scheduled to begin accepting waste in 2002. It is likely that this will affect the age of spent fuel transported across the country. In order to move as much fuel from their sites as possible, utilities will likely ship fuel to Utah and allow it to cool there while they ship more, less-cooled fuel from their sites to Yucca Mountain. DOE has established an acceptance quota for reactor fuel, and the current regulations allow the transportation of spent fuel aged only five years. For utilities, the most advantageous use of transportation is to further reactor decommissioning. Further, DOE would have to pay the cost of casks and transportation of this newer fuel. Older fuel would then be shipped at a much later date, much of it from Skull Valley, Utah.

The consideration of older fuel in its transportation analysis serves to ignore many potentially important contributors to overall dose. As radioactive materials follow an exponential decay pattern, using longer-cooled fuel than is realistic results in serious underestimates of the risks involved with spent fuel transportation to Yucca Mountain. In a 25.8-year period, important radioactive contaminants in irradiated fuel will have decayed away. For example, Co⁶⁰, a main contributor to radiation dose from crud spallation, has a half-life on the order of 5 years. Concentrating on 25.8-year fuel decreases the amount of Co⁶⁰ modeled by a factor of 2⁵, or 32, seriously reducing possible radiological effects in the event of a release.

Because the NRC has established a minimum cooling time of 5 years before fuel is permitted for transport, it is our recommendation that this be used to determined the consequences of accidents involving shipments of spent nuclear fuel. The potential ability of utilities to discharge their currently stored spent nuclear fuel to the proposed PFS site in Utah would likely result in newer fuel being shipped directly from these utilities to Yucca Mountain. The new, thinner cask designs should be assessed based on their performance when holding this young, high burnup fuel.

4. Improper attention to Intermodal Transfer Station

4.1. Crash scenarios analyzed

4.1.1. Airplane crash scenario

The airplane crash scenario assumes that the crash velocities will be those typical of takeoff and landing operations. As a worst-case scenario, the potential impact of a crashing military jet traveling at 600mph should be considered. It is also essential to consider the following in addition to airplane engines in the analysis: engine shafts, munitions (both live and dummy), and any missiles tested on site. The use of engines as the "design missile" traveling at speeds comparable with takeoff and landing procedures ignores some important crash scenarios.

5. Economic analysis of transportation costs

5.1. The EIS did not assess the costs of severe accidents when assessing the transportation costs involved in the Yucca Mountain Project. (In order to aid in the adequate preparation for potential accidents, an estimate of the true cost of remedying such an accident is essential. This assessment must include, but is not limited to, the following: emergency costs, surface cleanup costs, decontamination costs (of roadways, buildings, groundwater, surface water, etc.), hospital costs to injured parties, lost workdays due to building contamination, economic losses due to fear of contamination, loss of tourism (e.g., in the event of an accident in Las Vegas), evacuation costs, relocation costs, contaminated food embargo costs, insurance costs, legal costs, governmental costs, and so forth.

The RADTRAN computer code used to determine radiological consequences of transportation accidents has an optional economic analysis contained within the program. No mention of this analysis is given in the Yucca Mountain EIS. There is no indication given as to the reasons why this analysis is not considered. Two separate economic analyses must be performed by DOE with regards to spent fuel transportation to Yucca Mountain. The first should be included with the risk assessment estimating the expected health effects of the transportation program, obtained by multiplying the consequences of each scenario by its probability of occurrence. This is essential to provide a more accurate depiction of the true costs associated with the transportation aspect of the Yucca Mountain project. The second should be included with the "maximum reasonable foreseeable action" scenario to estimate what the economic costs of a severe transportation accident would be. The RADTRAN computer code has the capability of performing estimates for both of these scenarios. These need to be included in any comprehensive risk assessment.

An economic estimate of the impacts of a plutonium-dispersal accident has been performed at Sandia National Laboratory (SAND96-0957). A similar estimate needs to be performed for spent fuel transportation to Yucca Mountain. calculations using Transnet RADTRAN5 or our in-house RADTRAN4.

6. Underestimation of Transportation Distances

The Yucca Mountain EIS ignores the likely possibility of intermodal transfer stations outside of Nevada. For example, A license application is pending before the NRC for the Private Fuel Storage Irradiated Spent Fuel Storage Installation at Skull Valley, Utah. If this is approved, it will likely become a "rest stop" for shipments of spent fuel from commercial reactor sites en route to Yucca Mountain. The PFS is designed to accommodate ½ of the nation's commercial spent nuclear fuel en route to Yucca Mountain. The EIS needs to address the impacts of such a location. This will affect the number of shipments of spent nuclear fuel through the State of Nevada. For example, spent nuclear fuel from commercial reactors in Southern California will be transported through Nevada *twice* if the proposed PFS facility begins operations. This will involve the transport of spent nuclear fuel through the Las Vegas area twice. The failure of the EIS to consider the additional miles of transportation due to additional intermodal transfer and

temporary storage facilities results in an underestimation of the effects of spent fuel transportation.

Because the proposed PFS facility will operate as an integral part of the Yucca Mountain operation scheme, their effects cannot be treated separately. The existence of such a facility will directly affect the number of shipments and the transportation routes. It will also affect the average age of spent fuel being shipped. All of these factors need to be considered by DOE, and none of these factors have been.

7. Consideration of only respirable-sized particles

The Yucca Mountain Draft EIS consistently and repeatedly underestimates health effects due to severe accident or terrorist events by concentrating only on the fraction of respirable particles released during such an event. This results in a severe underestimation of the radiological effects due to inhalable particles and direct gamma dose. In the event of an accident release, particles of sizes on the order of 10µm or less will be dispersed readily into the environment. These particles can be deposited in the human body by deposition into the nasal cavity and subsequent ingestion. Alternately, these particles can contribute to skin contamination, increasing the dose attributable to radiological releases significantly. This has not been accounted for in the EIS treatment of sabotage or severe accident consequences.

Summary:

The above points are not exhaustive: however, they give a good indication of some of the major deficiencies in the EIS's treatment of transportation. Because of these deficiencies, it is recommended that DOE perform a completely new transportation assessment, using new experimental data. This new experimental data involves sabotage, transportation accident frequencies, and transportation accident release fractions and consequences. For the sabotage experiments, it is recommended that new tests be performed subjecting modern rail and truck casks to multiple strikes with a TOW 2 missile or its equivalent. The computer model used in the Luna report is unjustified and unacceptable. For the accident release fractions, it is recommended that the DOE perform a new Modal Study, using modern truck and rail casks and developing new parameters with which to measure accident severity and cask response. Further, modern data needs to be collected concerning the effect of speed limit on accident distributions.

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| 8 | MS. | SHANKLE: | I'm | Judy | Shankle | from | Mineral | County |
|---|-----|----------|-----|------|-----------|-------|-----------------|----------|
| - | | | - " | , | DITIONING | T T O | 1.1 *********** | COULTLY. |

- 9 I'm one of the AULG representatives, and my statement today
- 10 is basically general, but I will be submitting more
- 11 involved and detailed statements.
- Mineral County does not agree that: (a) The
- 13 radioactive waste should be buried, because there's no way
- 14 mankind can predict what will happen in the future.
- 15 Alternative ways should be studied so technology can find a
- 16 way to reuse this radioactive waste. Burying something as
- 17 deadly as radioactive waste does not solve any problems.
- 18 If anything, it might create more problems.
- 19 (b) Transporting highly radioactive waste in
- 20 43 states is -- it does not agree that it's prudent. Why
- 21 would anyone want to endanger the public and environment
- 22 along these routes? A no-action scenario provided by the
- 23 Department of Energy indicated that the figures of possible
- 24 latent fatalities would be the same or less than burying
- 25 the radioactive waste at a repository. And I did attach a



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8/

- 1 sample of that.
- 2 America, be it rural or urban, is not ready
- 3 to handle the transportation of spent nuclear fuel or
- 4 high-level radioactive waste of this magnitude. The rural
- 5 areas do not have: (a) Good or safe roads to transport this
- 6 nuclear waste, especially if alternative routes are
- 7 selected; (b) Railroads to get it to Yucca Mountain; (c)
- 8 The necessary equipment nor trained personnel to act upon a
- 9 radioactive accident; (d) Money to handle a radioactive
- 10 accident and support its own county.
- 11 The cost to ensure that the rural areas
- 12 would be able to transport the radioactive waste would
- 13 probably exceed the no-action alternative. Urban areas are
- 14 too populated to transport it through and around.
- Taking care of the radioactivity exposed
- 16 would be costly. Finding alternative ways, although costly
- 17 initially, would probably be less costly in the long run
- 18 for two reasons: (1) The money that the commercial
- 19 reactors set aside could pay for most of the cost; and, (2)
- 20 When new uses are found, new money would be brought in and
- 21 eventually the alternative pays for itself.
- 22 Finally, the cost of cleanup at the nuclear
- 23 test site; cost to build new routes, rail or roads; and
- 24 cost to clean up a radioactive accident would probably far
- 25 exceed finding alternative ways to reuse this radioactive

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| 1 | waste | |
|---|-------|--|
| 1 | waste | |

- 2 Mineral County wants it put on record that a
- 3 health assessment should be done of all the affected
- 4 counties. This assessment would reflect what is out there
- 5 now. By showing the present health situations now, a case
- 6 may be made for not adding to the potential number of
- 7 latent cancer fatalities.
- 8 Mineral County would like to have a separate
- 9 standard for transporting of radioactive waste.
- 10 Transporting highly radioactive waste in 43 states,
- 11 possibly affecting 53 million people, is not prudent. Why
- 12 would anyone want to endanger the public and environment
- 13 along these routes?
- MR. SKIPPER: Thank you for your comments.
- THE FACILITATOR: Thanks very much.
- 16 Our next speaker is Steven Kalish.

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Lone Pine, CA Exhibit 1-1 11/4/99

STATEMENT OF JULITY SHANKIE

Mineral County's Statement to the Dept. of Energy for Yucca Mountain

EIS001660

Mineral County does not agree that:

- a. The radioactive waste should be buried because there is no way mankind can predict what will happen in the future. Alternative ways should be studied so technology can find a way to reuse this radioactive waste. Burying something as deadly as radioactive waste does not solve any problems. If anything it might create more problems.
- b. Transporting highly radioactive waste through 43 states is prudent. Why would anyone want to endanger the public and environment along these routes. A no-action scenario provided by the Department of Energy indicated that the figures of possible latent fatalities would be the same or less than burying the radioactive waste at a repository (see attachment A).

America, be it rural or urban is not ready to handle the transportation of Spent Nuclear Fuel or High-Level Radioactive Waste of this magnitude. The rural areas do not have:

- a. Good or safe roads to transport this nuclear waste, especially, if alternative routes are selected;
- b. Railroads to get it to Yucca Mountain;
- c. The necessary equipment, nor trained personnel to act upon a radioactive accident;
- d. Money to handle a radioactive accident and support its own county.

The cost to ensure that the rural areas would be able to transport the radioactive waste, would probably exceed the no-action alternative. Urban areas are to populated to transport it through and around them.

Taking care of the radioactively exposed would be costly. Finding alternative ways although costly initially would probably be less costly in the long run for two reasons:

- 1. The money that the commercial reactors set aside could pay for most of the cost, and
- 2. When new uses are found, new money would be brought in and eventually the alternative pays for itself.

Finally, the cost of clean up at the Nevada Test Site, cost to build new routes (rail or roads), and cost to clean up a radioactive accident would probably far exceed finding alternative ways to reuse this radioactive waste.

* (5)

Draft Yucca Mountain Environmental Impact Statement Comparison of Proposed Action to No Action Alternatives Total Fatalities Per Year

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(derived from data in Table 2-7)

| 3,300 | .33 | 25.4 | 19.06 | .25 | 6.35 | .25 | No Action #2 |
|---------------------------------------|--|--------------|-------------|------------|---|----------|--------------|
| 1,095 | . 11 | 25.4 | 19.06 | .25 | 6.35 | .25 | No Action #1 |
| X 10.8-5.3 X 10.8 5 X 10.5-5.3 X 10.4 | 5 X 10 ⁻⁸ -5.3 X 10 ⁻⁸ | 21.70-71.66 | 3.01-4.53 | .0406 | 18.70-67.13 | .75-2.69 | Proposed |
| 9,900yr. Total | 101-10,000yrs. | 100yr. Total | 75yr. Total | 25-100yrs. | 24yr. Total 25-100yrs. 75yr. Total 100yr. Total | 0-24угѕ. | Altemative |

Conclusions

- During the period 0-24 years Proposed Action is 3-10 times riskier that the No Action alternatives.
- 5 During the period 25-100 year No Action #1 is 4-6 times riskier than the Proposed Action
- 'n During the first 100 years Proposed Action is a little less to nearly three times riskier than No Action alternatives.
- 4 During the period 101 - 10,000 years No Action Alternative is 1,000 to 3,000 times riskier than the Proposed Action
- 'n highway accidents rather than exposure to radiation During first 24 years of repository operation, transportation is the source of over 95 percent of all fatalities, with most being from

(ATTACHMENT A)



^{1/} Proposed Action - disposal at Yucca Mountain

No Action Alternative #1 - on-site storage of wastes with long-term institutional controls No Action Alternative #2 - on-site storage of wastes without long-term institutional controls

Peno-Marring - Judy Shankle session

Mineral County's Statement to the Department of Energy's (DOE's) Draft Environmental Impact Statement (DEIS) for Yucca Mountain (December 1 & 2, 1999) RECEIVED
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1. Mineral County believes that:

a. The radioactive waste should not be buried because there is no way mankind can predict what will happen in the future. Alternative ways should be studied so technology can find a way to reuse this radioactive waste. Burying something as deadly as radioactive waste does not solve any problems. If anything it might create more problems. (and)

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- b. Transporting highly radioactive waste through 43 states is not prudent. Why would anyone want to endanger the public and environment along these routes.
- 2. Mineral County believes that a number of issues are not addressed properly, not addressed adequately, or not addressed at all in the Draft #EIS. These issues include but are not limited to:
 - a. Impacts on local government programs and costs The DEIS does not adequately address specific community, statewide, and regional impacts. Rural counties do <u>not</u> have money to handle a radioactive accident. The cost to ensure that the rural counties would be able to accommodate the transportation of the radioactive waste, would probably exceed the no-action alternative.
 - b. Uncertainty in models and data used for site characterization and repository performance. Mineral County's flood plain map is incorrect. If this is so, how reliable is the information gathered for Yucca Mountain and other areas? The flood plain report in the DEIS is too generalized. Mineral County would like to have a detailed flood plain analysis done of Yucca Mountain and each affected county.
 - c. Unreasonable "No-action" alternatives Two no-actions alternatives were provided. One would have the radioactive waste stay where it is under institutional control for just 100 years. The second would have the waste stay under institution control for 10,000 years. DOE acknowledges that neither is likely to occur but says that other scenarios would be too speculative. Mineral County would like to have reasonable alternatives analyzed.
 - d. Cumulative impacts (low-level radioactive waste shipments to and storage at the Nevada Test Site).
 - e. The DEIS provides a "generic" transportation analysis. Specific transcontinental routes and communities along the way are not identified. Other transportation issues of the waste to the site are:
 - * Mode not clearly identified. Three possible modes of transportation are identified.
 - The waste could be driven on interstates using legal-weight trucks.
 - It could be sent by train which includes five options of building a railroad to Yucca Mountain (YM).
 - It could be transported by "Heavy Haul" which is rail to a transfer point in Nevada, then transferred to 200-foot heavy-haul trucks and transported to YM.
 - * Routing many possible routes, none studied adequately. Rural areas do <u>not</u> have good or safe roads to transport this nuclear waste, especially, if alternative routes are selected; nor do they have railroads to get it to Yucca Mountain.
 - * Land use consideration of present and planned land uses along possible routes identified.



Page 2

Mineral County's Statement to the DOE's Draft Environmental Impact Statement for Yucca Mountain (December 1 & 2, 1999)

EIS000391

- * Emergency Response training, preparedness and funding. Rural areas do <u>not</u> have the necessary equipment, nor trained personnel to handle a radioactive accident.
- * Terrorist/extremist threats DOE has used old data to provide this information.
- * Casks DOE will change the design of the casks which would be used to transport the High-Level Radioactive Waste. The DEIS does not address whether the new design of the casks has been analyzed. Have these new casks been built and tested? What is the integrity of the valves and seals? Full scale cask testing is needed rather than computer simulations.
- * Weather although weather does not seem to be an issue. Mineral County believes it is a big issue. Most of the radioactive waste would be transported through the northern part of Nevada. This part of the state may have bad weather from November to May as well as many other states from east, central, and northwest America (see Figures S-10 or S-11, attached). Will the radioactive waste be transported during this time frame? The DEIS does not have adequate information in case of road closures due to inclement weather nor provide complete information about safe havens.

Mineral County wants it put on record that the Draft Environmental Impact Statement is inadequate with regard to addressing transportation. The DEIS should provide feasibility studies and impacts, and a comprehensive and thorough analysis of modes and specific routes. Transporting highly radioactive waste through 43 states (possibly affecting about 53 million people) is not prudent and would endanger the public and environment along these routes.

- 3. The cost of clean up at the Nevada Test Site, cost to build new routes (rail or roads), and cost to clean up a radioactive accident would probably far exceed finding alternative ways to reuse this radioactive waste.
- 4. Mineral County wants it put on record that a "health assessment" (at the cost of DOE) should be done now of all the affected counties. This assessment would reflect what is out there now. By showing the present health situations now, a case may be made for not adding to a potential number of latent cancer fatalities, and for documenting current health conditions prior to a radioactive waste accident.

Mineral County will be submitting more detailed and additional comments by the Feb 9th comment deadline.

Judith A. Shankle, Nuclear Projects Office Mineral County AULG Representative Hawthorne, NV 89415 (775) 945-2484/2485



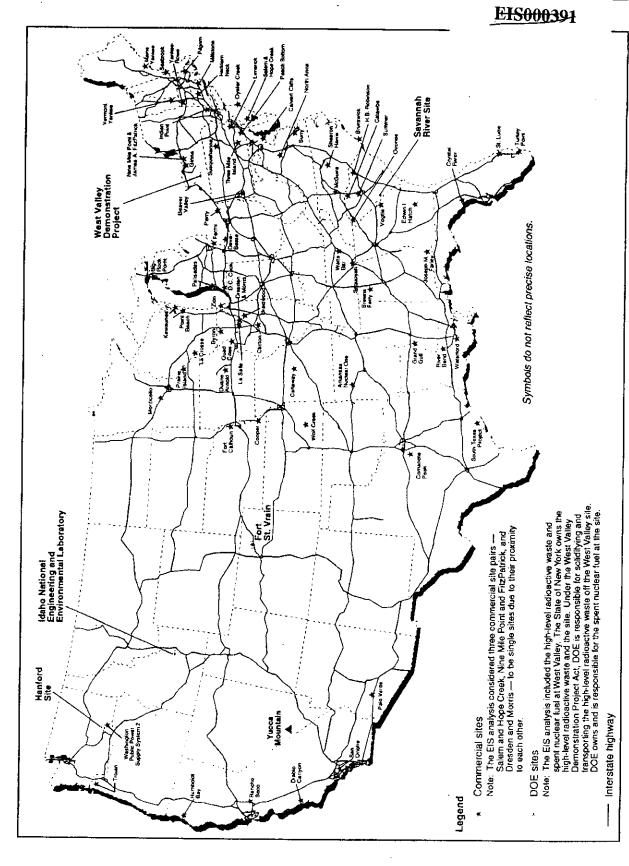


Figure S-10. Commercial and DOE sites and Yucca Mountain in relation to the U.S. Interstate Highway System.

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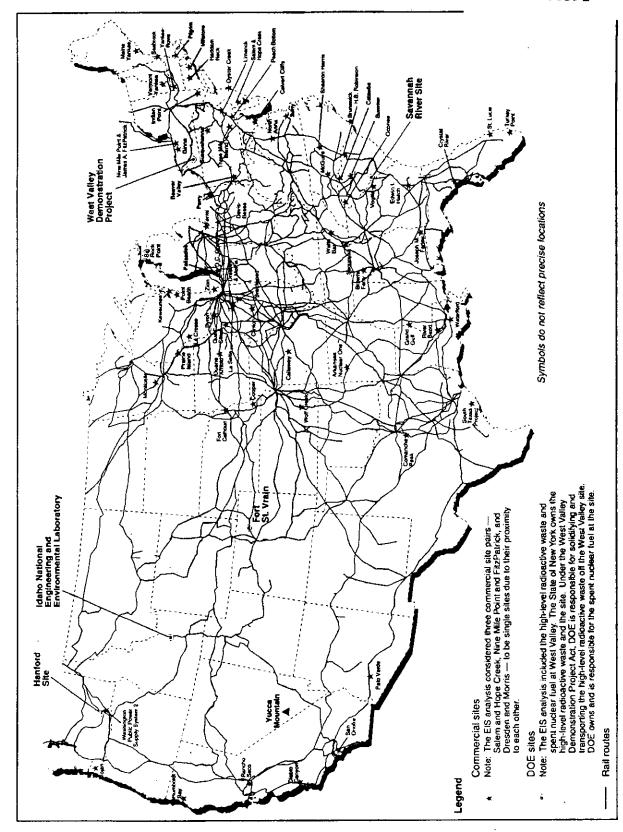


Figure S-11. Commercial and DOE sites and Yucca Mountain in relation to the U.S. railroad system.



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MS. SHANKLE: I'm Judy Shankle representing Mineral County, which is one of the affected units of local government.

Mineral County believes that a number of issues were not addressed properly, adequately or not addressed at all in the Draft EIS. The issues include but are not limited to impacts on local government programs and costs. The Draft EIS does not adequately address specific community statewide and regional impacts.

Rural counties do not have money to handle a radioactive accident. The cost to insure that the rural counties would be able to accommodate the transportation of radioactive waste would probably exceed the no action alternative.

Uncertainty in models and data used for site characterization and repository performance.

Mineral County's flood plain map is incorrect. If this is so, how reliable is the information gathered for Yucca Mountain and other areas?

The flood plain report in the DEIS is too generalized. Mineral County would like to have a detailed flood plain analysis done of Yucca Mountain and each affected county.

Unreasonable no action alternatives. Two no action alternatives were provided. One would have the radioactive waste stay . where it is under institutional control for just 100 years.

The second would have the waste stay under institutional control for 10,000 years. DOE acknowledges that neither is likely to occur but says that other scenarios would be too speculative. Mineral County would like to have reasonable alternatives analyzed and included in the EIS.

Cumulative impacts. Low level radioactive waste shipments to and storage at the Nevada Test Site. The DEIS provides a generic transportation analysis. Specific transcontinental routes and communities along the way are not identified.

Other transportation issues of the waste to the site are: mode. Not clearly identified. Three possible modes of transportation are identified.

The waste could be driven on interstates using legal weight trucks. It could be sent by train which includes five options of building a railroad to Yucca Mountain. It could be transported by heavy haul, which is rail to a transfer point in Nevada. Then transferred to 200 foot heavy-haul trucks and transported to Yucca Mountain.

Routing. Many possible routes, none studied adequately.

Rural areas do not have good or safe roads to transport this nuclear waste, especially if alternative routes are selected. Nor do they have railroads to get it to Yucca Mountain.

Land use consideration of present and planned land uses along possible routes identified. Emergency response, training, preparedness and funding.

Rural areas do not have the necessary equipment nor trained personnel to handle a radioactive accident.

Terrorist extremist threats. DOE has used old data to provide this information.

Casks. DOE will change the design of the casks which would be used to transport the high level radioactive waste. The DEIS does not address whether the new design of casks has been identified. Have these new casks been built and tested? What is the integrity of he valves and seals? Full scale cast testing is needed rather than computer simulations.

Weather. Although weather doesn't seem to be an issue, Mineral County believes it is a big issue. Most of the nuclear waste would be transported through the northern part of Nevada. This part of the state may have bad weather from November to May, as well as other states from East, Central and Northwest America. Will the radioactive waste be transported during this time frame?

The DEIS does not have adequate information in case of road closures due to inclement weather nor provide complete information about safe havens.

Mineral County wants it put on record that the Draft
Environmental Impact Statement is inadequate with regard to addressing
transportation. The DEIS should provide feasibility studies and
impacts and a comprehensive and thorough analysis of modes and

specific routes. Transporting highly radioactive waste through 43 states possibly affecting about 53 million people is not prudent and EISO01660 would endanger the public and environment along these routes.

The cost of the cleanup at the Nevada Test Site, cost to build new routes, rail or roads, and cost to clean up for radioactive accident would probably far exceed finding alternative ways to reuse this radioactive waste.

Mineral County would like to put on record that a health assessment at the cost of DOE should be done now of all the affected counties. This assessment would reflect what is out there now. By showing the present health situations now, a case may be made for not adding to potential number of latent cancer fatalities and for documenting current health conditions prior to a radioactive waste accident.

The radioactive waste should not be buried because there is no way mankind can predict what will happen in the future. Alternative ways should be studied so technology can find a way to reuse this radioactive waste.

Burying something as deadly as nuclear waste does not solve any problems. If anything, it might create more problems.

Mineral County will be submitting more details and additional comments by the February 9th comment deadline.





Judy Shankle

EIS000723

Mineral County's Statement to the Department of Energy's (DOE's) Draft Environmental Impact Statement (DEIS) for Yucca Mountain (January 11,2000/Las Vegas)

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- 1. Mineral County believes that a number of issues are not addressed properly, not addressed adequately or not addressed at all in the Draft EIS. These issues include but are not limited to:
 - a. Impacts on local government programs and costs The DEIS does not adequately address specific community, local government, statewide, and regional impacts. Rural counties do not have money to handle a radioactive accident. The cost to ensure that the rural counties would be able to accommodate the transportation of the radioactive waste, would probably exceed the no-action alternative.
 - b. Uncertainty in models and data used for site characterization and repository performance.

 Mineral County's flood plain map is incorrect. If this is so, how reliable is the information gathered for Yucca Mountain and other areas? The flood plain report in the DEIS is too generalized. Mineral County would like the EIS to contain a current and detailed flood plain analysis of Yucca Mountain and each affected county.
 - c. Statistics for the population and growth of Nevada is out-dated. The population of places like Las Vegas, Reno, Carson City, and Pahrump have significantly increased. With the population increase has come an increase in use of Nevada's transportation system. Along with this increase has come an increase in accidents all over Nevada. What precautions are being taken; or safe-havens being used, updated or built to ensure the safe transportation of the high-level radioactive waste? The EIS should contain this information use in a current date.
 - d. The DEIS provides a "generic" transportation analysis. Specific transcontinental routes and communities along the way are not identified. Other transportation issues of the waste to the site are:
 - * Mode not clearly identified. Three possible modes of transportation are identified.
 - The waste could be driven on interstates using legal-weight trucks.
 - It could be sent by train which includes five options of building a railroad to Yucca Mountain (YM).
 - It could be transported by "Heavy Haul" which is rail to a transfer point in Nevada, then transferred to 200 foot heavy-haul trucks and transported to YM.
 - * Routing many possible routes, none studied adequately. Rural areas do <u>not</u> have good or safe roads to transport this nuclear waste, especially, if alternative routes are selected; nor do they have railroads to get it to Yucca Mountain.
 - * Land use consideration of present and planned land uses along possible routes identified Mineral County (MC) will be promoting tourism. One area for tourism is hiking and outdoor activities. Another consideration for MC's land would be to have a private prison in an area close to one of the possible routes.
 - * Emergency Response training, preparedness and funding. Rural areas do <u>not</u> have the necessary equipment, nor trained personnel to handle a radioactive accident.
 - * Terrorist/extremist threats DOE has used old data to provide this information.
 - * Casks DOE will change the design of the casks which would be used to transport the High-Level Radioactive Waste. The DEIS does not address whether the new design of the casks has been analyzed. When will the new casks be built and tested? What is the integrity of the valves, seals, and shielding? Full scale cask testing is needed rather than computer simulations.
 - * Weather and Natural Disasters although weather does not seem to be an issue.

 Mineral County believes it is a big issue. Most of the radioactive waste would be transported through the northern part of Nevada. This part of the state may have bad

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Page 2

Mineral County's Statement to the DOE's Draft Environmental Impact Statement for Yucca Mountain (January 11, 2000/Las Vegas)

EIS000723

weather from November to May as well as many other states from east, central, and northwest America (see Figures S-10 or S-11, attached). Will the radioactive waste be transported during this time frame? The DEIS does not have adequate information in case of road closures due to inclement weather nor provide complete information about safe havens or alternate routes for trucks and sidings for rail. On June 12, 1994, Mineral County had an earthquake with a 6.0 magnitude (extracted from an "Earthquakes in NV 1852-1996" map/chart for the NV Bureau of Mines & Geology by UNR Seismological Lab.) Even if Yucca Mountain would withstand a strong earthquake, what is being done to protect the transport of the high-level nuclear waste during earthquakes, hurricanes, tornados, etc.?

Mineral County wants it put on record that the Draft Environmental Impact Statement is inadequate with regard to addressing transportation. The DEIS should provide feasibility studies and impacts; and a comprehensive and thorough analysis of modes, specific routes, and emergency procedures in case a radioactive accident or natural disaster should occur. Transporting highly radioactive waste through 43 states (possibly affecting about 53 million people within one/half mile of the routes) is not prudent and would endanger the public and environment along these routes.

- 2. The cost of clean up at the Nevada Test Site, cost to build new routes (rail or roads), cost to ensure precautions are being taken, cost to train emergency response staff, and cost to clean up a radioactive accident would probably far exceed finding alternative ways to reuse this radioactive waste. The EIS has an inadequate analysis of the costs. It should include analysis of the eventuality of the waste at Yucca Mountain; and funds to monitor it, costs of drip shields, back fill, leaks and repair.
- 3. Mineral County wants it put on record that a "health assessment" (at the cost of DOE) should be done now of all 10 affected counties. This assessment would reflect what is out there now. By showing the present health situations now, a case may be made for *not* adding to a potential number of latent cancer fatalities, and for documenting current health conditions prior to a radioactive waste accident.
- 4. Mineral County believes that the radioactive waste should not be buried because there is no way mankind can predict what will happen in the future. Alternative ways should be studied so technology can find a way to reuse this radioactive waste. Burying something as deadly as radioactive waste does not solve any problems. If anything it might create more problems.

Mineral County will be submitting additional comments by the Feb 9th comment deadline.

Judith A. Shankle, Nuclear Projects Office Mineral County AULG Representative Hawthorne, NV 89415 (775) 945-2484/2485



Figure S-10. Commercial and DOE sites and Yucca Mountain in relation to the U.S. Interstate Highway System.





PUBLIC STATEMENT OF JUDITH SHANKLE

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MS. SHANKLE: I'm Judy Shankle from Mineral County, one of the affected units of local government represented.

Mineral County believes that the radioactive waste should not be buried because there's no way mankind can predict what will happen in the future. Alternative ways should be studied so technology can find a way to reuse this radioactive waste.

Burying something as deadly as radioactive waste does not solve any problems. If anything, it might create more problems.

Transporting highly radioactive waste through 43 states is not prudent. Why would anyone want to endanger the public and environment along these routes?

Mineral County believes that a number of issues are not addressed properly, not addressed adequately, or not addressed at all in the Draft EIS. These issues include but are not limited to: impacts on local government programs and costs. The DEIS does not adequately address specific community, statewide and regional impacts.

Rural counties do not have money to handle radioactive accidents. The cost to insure that rural counties would be able to accommodate the transportation of the radioactive waste would probably exceed the no action alternative.

Uncertainty in models and data used for site characterization and repository performance.

Mineral County's flood plan map is incorrect. If this is so, how reliable is the information gathered for Yucca Mountain in other areas? The flood plain report in the DEIS is too generalized. Mineral County would like to have a detailed flood plain analysis done of Yucca Mountain and each affected county.

Unreasonable no action alternatives. Two no action alternatives were provided. One would have the radioactive waste stay where it is under institutional control for just 100 years. The second would have the waste stay under institutional control for 10,000 years.

DOE acknowledges that neither is likely to occur but says that other scenarios would be too speculative. Mineral County would like to have reasonable alternatives analyzed.

Cumulative impacts. Low level radioactive waste shipments to and storage at the Nevada Test

Site. The DEIS provides a generic transportation analysis. Specific transcontinental routes and

communities along the way are not identified. Other transportation issues of the waste to the site are.

Mode. Not clearly identified. Three possible modes of transportation are identified. The waste could be driven on interstates using legal weight trucks; it could be sent by train, which includes five options of building a railroad to Yucca Mountain; it could be transported by heavy-haul, which is rail to a transfer point in Nevada, then transferred to 200-foot heavy-haul trucks and transported to Yucca Mountain.

Routing. Many possible routes. None studied adequately. Rural areas do not have good or safe roads to transport this nuclear waste, especially if alternative routes are selected. Nor do they have railroads to get it to Yucca Mountain.

Land use consideration of present and planned land uses along possible routes identified.

Emergency response. Training preparedness and funding. Rural areas do not have necessary equipment nor trained personnel to handle the radioactive accident.

Terrorists, extremist threat. DOE has used old data to provide this information.

Casks. DOE will change the design of the casks which would be used to transport the high level radioactive waste. The DEIS does not address whether the new design of the casks has been analyzed. Have these casks been built and tested? What is the integrity of the valves and seals? Full scale cast testing is needed rather than computer simulations.

Weather. Although weather does not seem to be an issue, Mineral County believes it is a big issue.

Most of the nuclear waste would be transported through the northern part of Nevada. This part of the state may have bad weather from November to May. As well as many other states from East, Central and Northwest America.

Will the radioactive waste be transported during this time frame? The DEIS does not have adequate information in case of road closures due to implement weather, nor provide complete information about safe havens.

Mineral County wants to put on record that the Draft Environmental Impact Statement is inadequate with regard to addressing transportation. The DEIS should provide feasibility studies and impacts and a comprehensive and thorough analysis of modes and specific routes.

Transporting highly radioactive waste through 43 states possibly affecting about 53 million people is not prudent and would endanger the public and environment along these routes. The cost of

cleanup at the Nevada Test Site, cost to build the new routes, rail and roads, and cost to clean up a radioactive accident would probably far exceed finding alternative ways to reuse this nuclear waste.

EIS001660

Mineral County wants it put on record that a health assessment at the cost of DOE should be done now of all the affected counties. This assessment would reflect what is out there now. By showing the present health situations now, a case may be made for not adding to potential number of latent fatalities and for documenting current health conditions prior to a radioactive waste accident.

MR. LAWSON: 30 seconds, please.

MS. SHANKLE: Mineral County will be submitting more detailed and additional comments by the February 9th comment deadline.

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